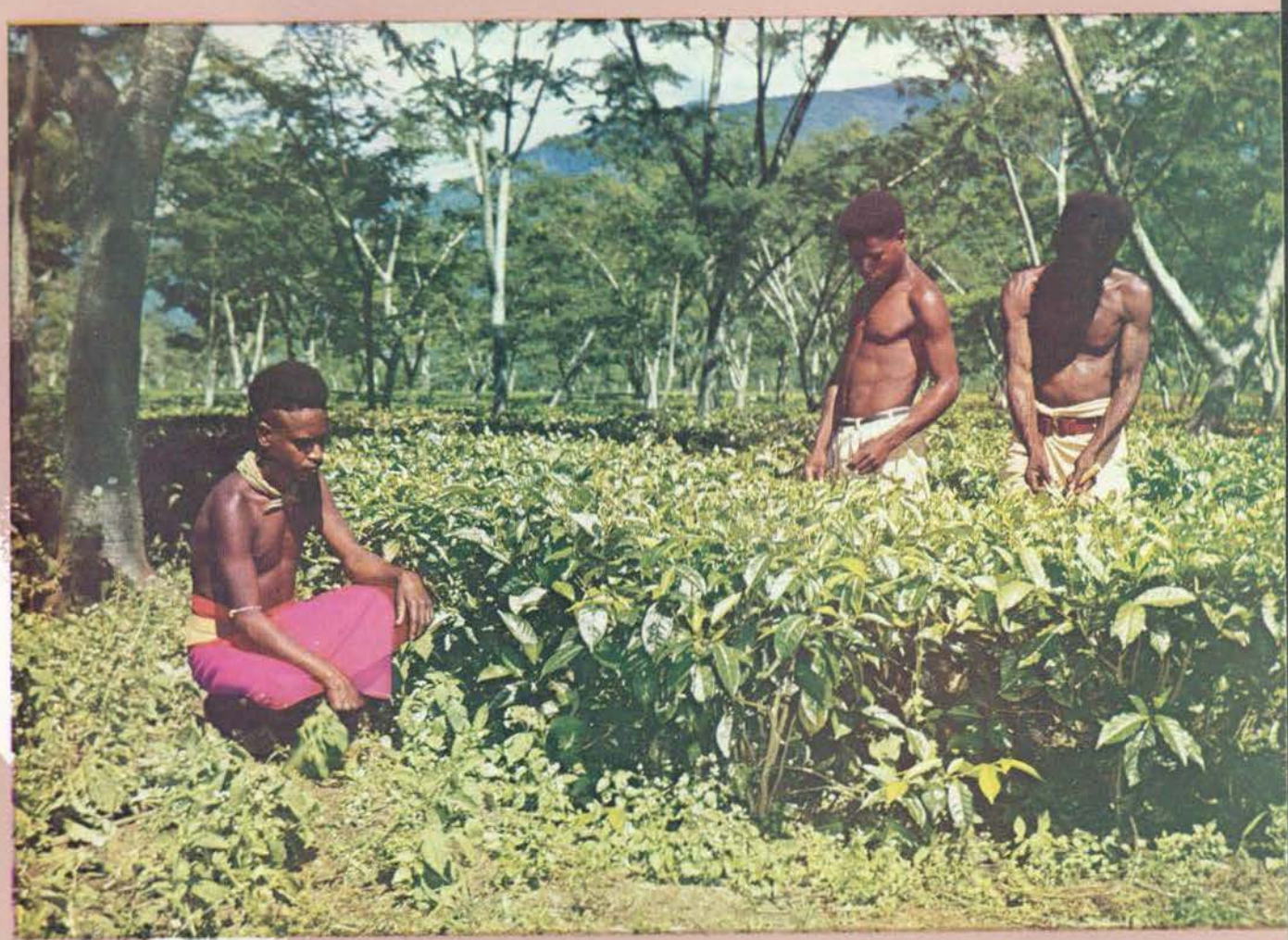
South Pacific bulletin



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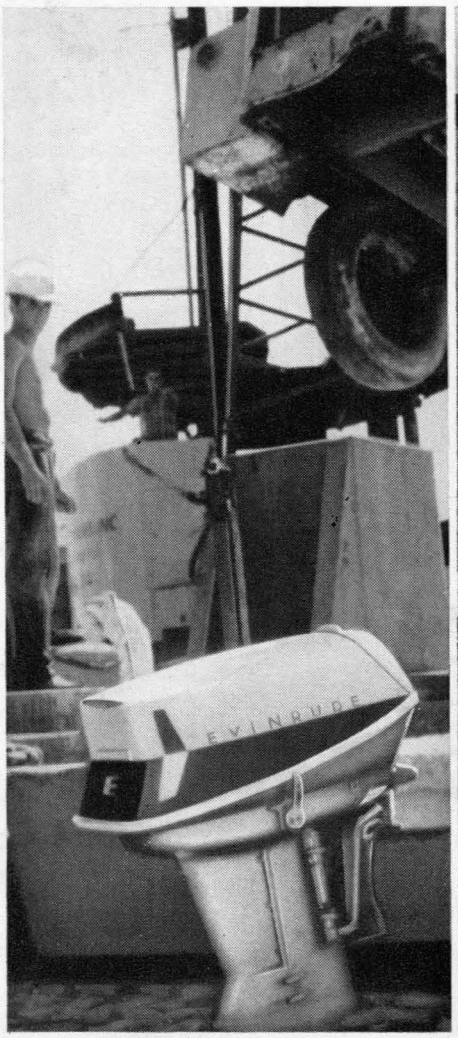

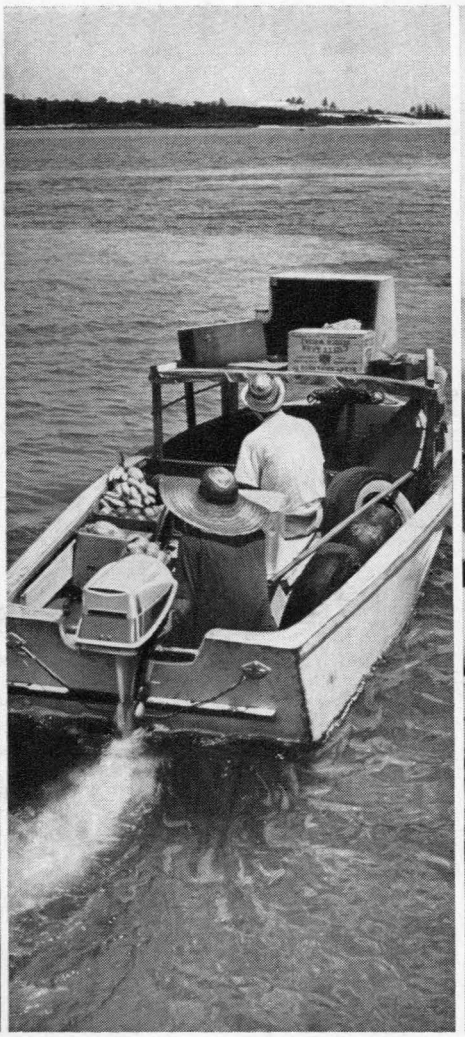

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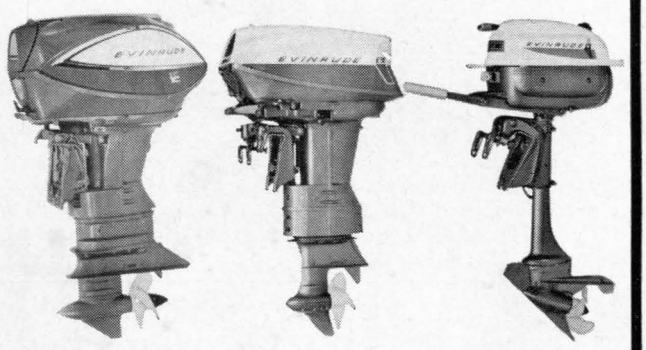

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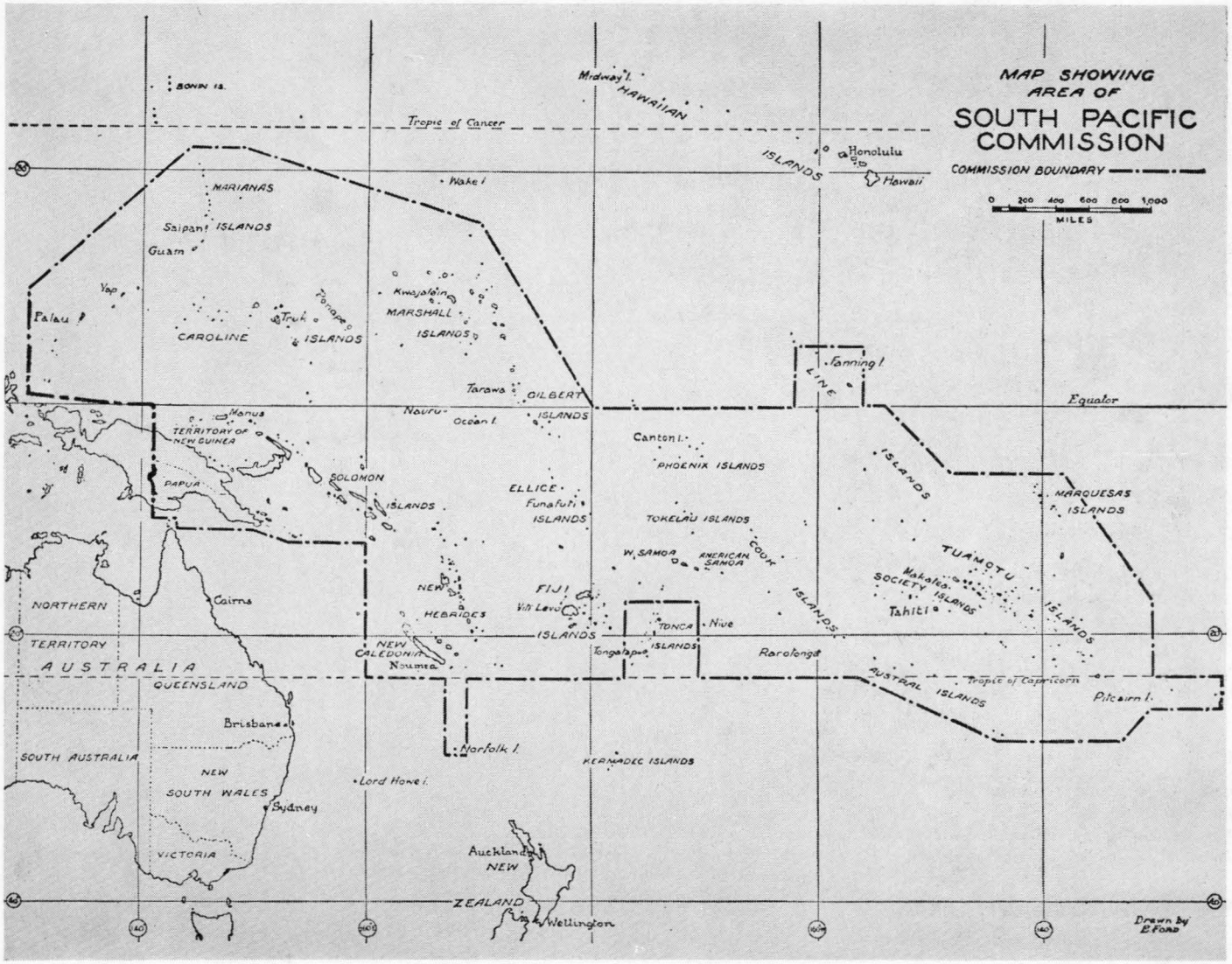

The South Pacific Commission

The South Pacific Commission is an advisory and consultative body set up in 1947 by the six Governments then responsible for the administration of island territories in the South Pacific region (Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America). Participation by the Netherlands Government ceased at the end of 1962.

The Commission's purpose is to advise the participating Governments on ways of improving the well-being of the people of the Pacific island territories. It is concerned with health, economic and social matters. Its headquarters are at Noumea, New Caledonia.

The Commission consists of not more than ten Commissioners, two from each Government. It normally holds one session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

There is a Research Council meeting normally once a year. This may be either a meeting of the full Council, or of one or other of its three main sections, specialising in the fields of health, economic development and social development. Members of the Research Council are appointed by the Commission. They are selected for their special knowledge of the questions with which the Commission is concerned, and the problems of the territories in these fields. The chief function of the Research Council is to advise the Commission on what investigations are necessary and on the work programme. Arrangements to carry out those that are approved are the responsibility of the Secretary-General and other principal officers.

The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Fiji in April, 1950. The second Conference was held at Commission headquarters in April, 1953, the third in Fiji in April-May, 1956, the fourth in New Britain in April-May, 1959, and the fifth in Pago Pago, American Samoa, in July, 1962.

The principal officers of the Commission are: Secretary-General, Mr. T. R. Smith; Executive Officer for Social Development, Dr. Richard Seddon; Executive Officer for Economic Development, Dr. Jacques Barrau; Executive Officer for Health, Dr. Guy Loison. The powers and functions of the Deputy Chairman, Research Council, are exercised by the Secretary-General.

FRONT COVER PHOTOGRAPH

IN THE NEW GUINEA HIGHLANDS. Tea plantation at Garaina, in the Morobe District. This project was established by the Administration of Papua and New Guinea to test the commercial possibilities of growing and processing tea in the territory. Very encouraging reports on sample consignments of Garaina tea have been received from importers in Australia and Britain. One Australian firm has ordered a trial shipment to test market reaction.

SOUTH PACIFIC BULLETIN

VOL. 13, No. 1 JANUARY, 1963

CONTENTS

EDITOR: *A. E. Read, B.Sc.*

THE SOUTH PACIFIC BULLETIN, first published in January, 1951, features articles on selected activities in the Commission's three main fields of operation: economic development, health and social development. Articles are also contributed by specialists working in these and related fields, in the territories within the Commission area.

THE BULLETIN is given selective world distribution to people and institutions in widely differing fields sharing a common interest in the purposes and work of the Commission. It is published in two editions, English and French.

SUBSCRIPTIONS and orders for single copies should be directed to: South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Subscription rates are given in the Table below.

ALL OTHER ENQUIRIES relating to the SOUTH PACIFIC BULLETIN should be directed to: The Editor, South Pacific Commission, Nouméa, New Caledonia.

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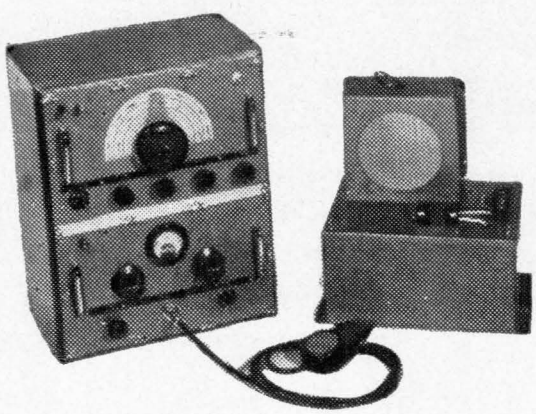

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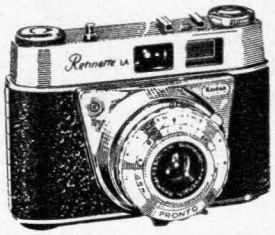

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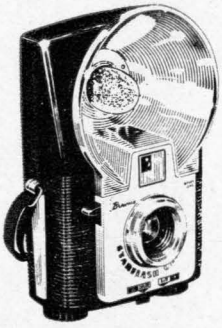

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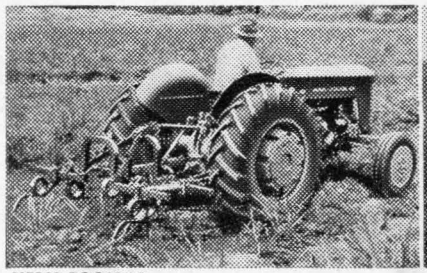

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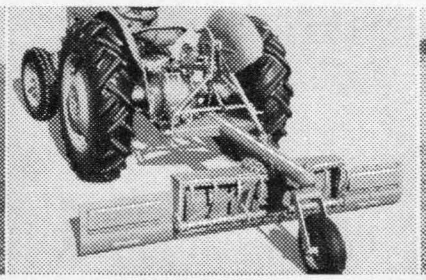

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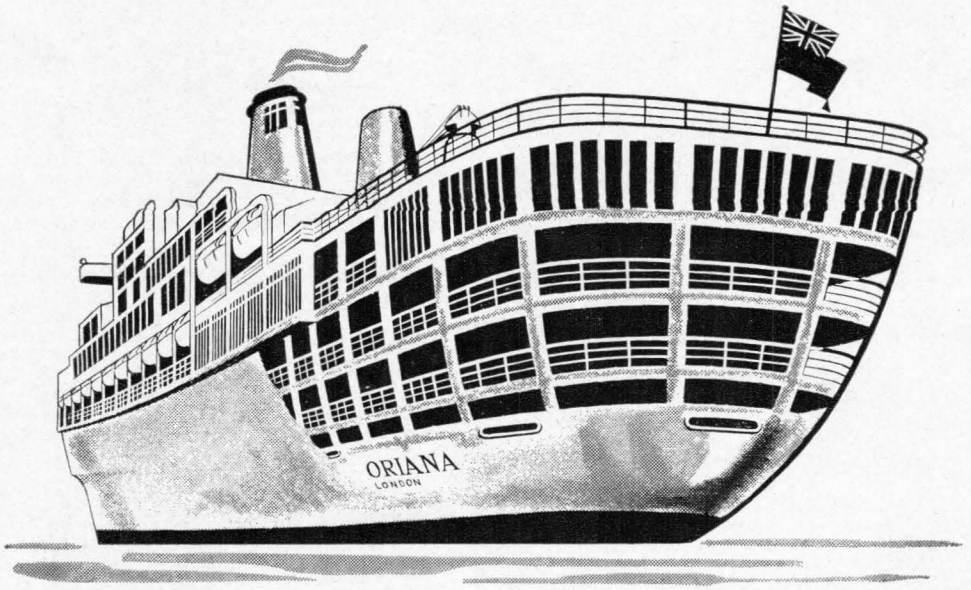

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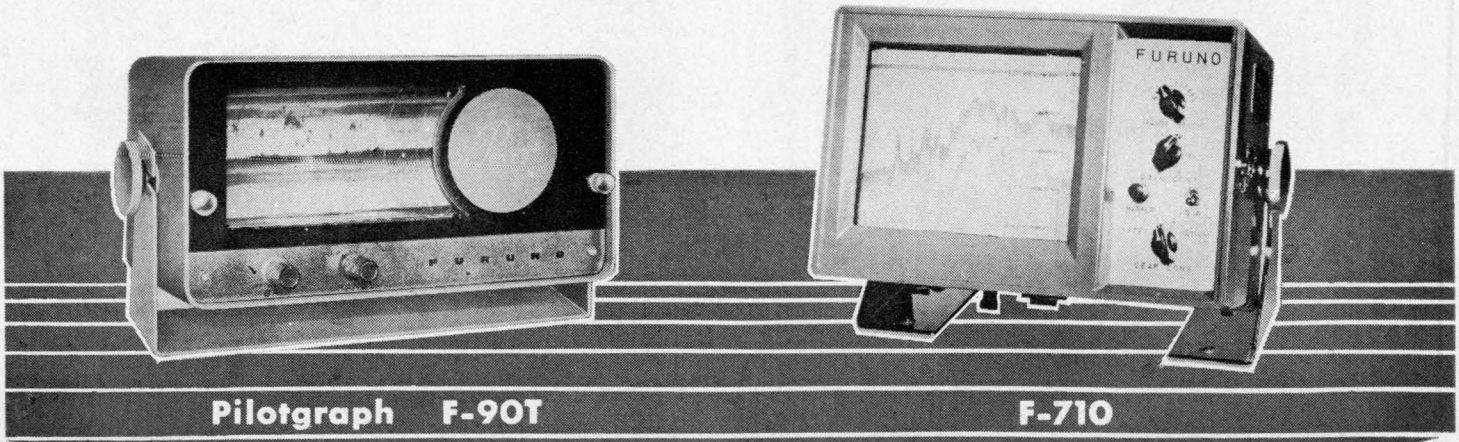

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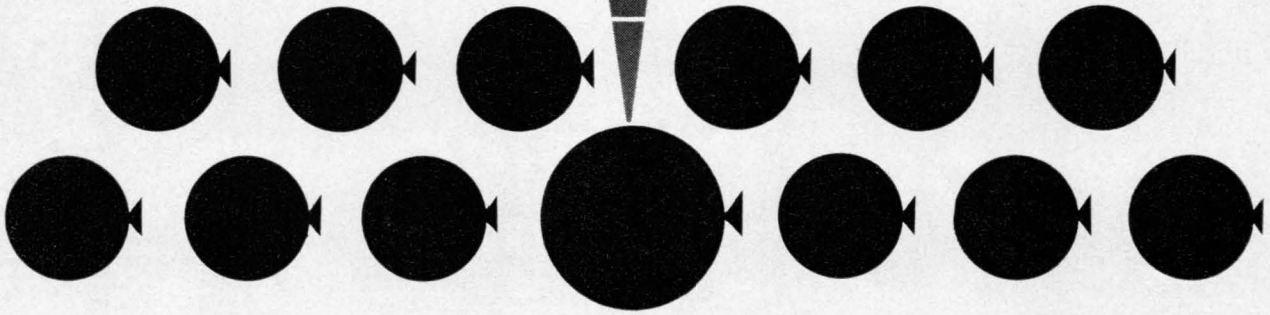

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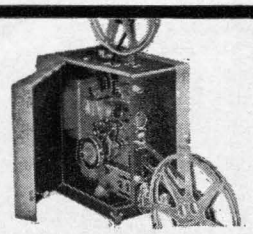

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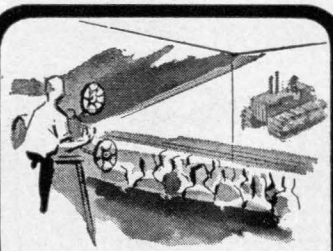

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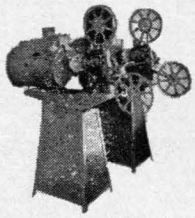

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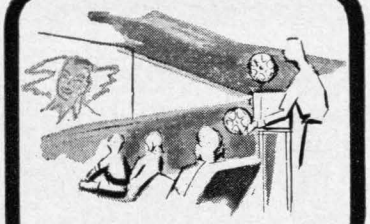

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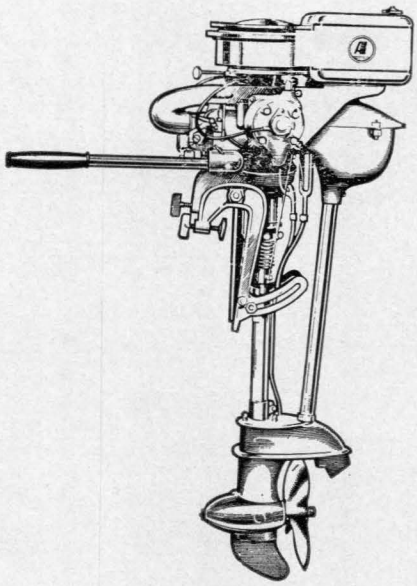

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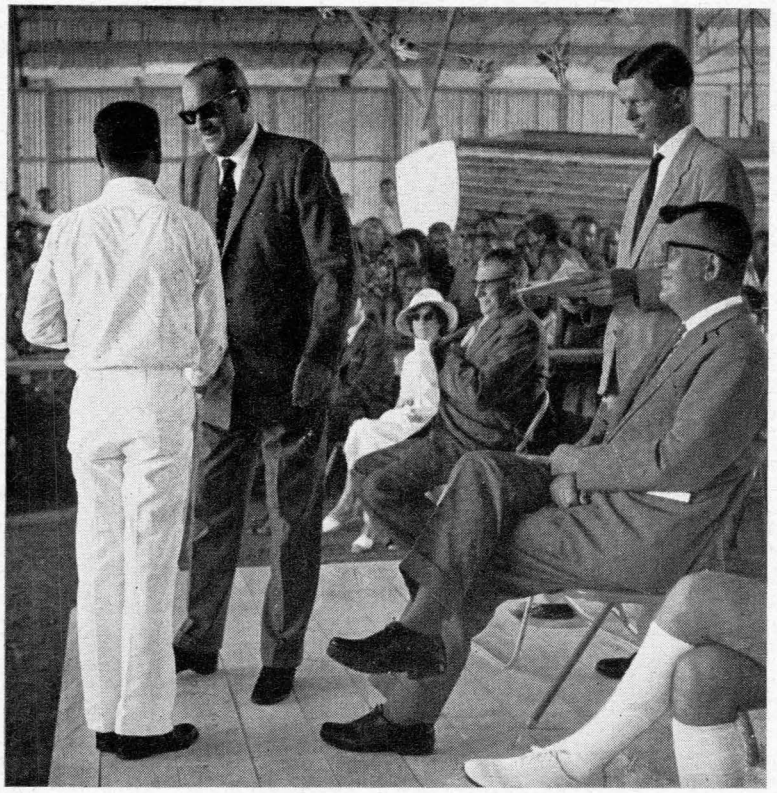


Sir David Trench presents a student with his certificate at the closing ceremony. Seated on the dais are the Director-Instructor of the School, Mr. Cecil Fisher (background), and Dr. Jacques Barrau, SPC executive officer for economic development (foreground).

School For Boatbuilders

. . . . *THE STORY OF AUKI*

On September 8 last the first South Pacific Regional Boatbuilding Course, initiated by the South Pacific Commission and sponsored by the Commission, the United Nations Technical Assistance Bureau, and the Government of the British Solomon Islands Protectorate, came to a formal close. For two years, twenty-four students from six South Pacific territories had received, at a School established for the purpose at Auki, in the Solomons, intensive practical training in the building, repair and maintenance of powered craft designed for use in the Islands.

By P. L. RYAN

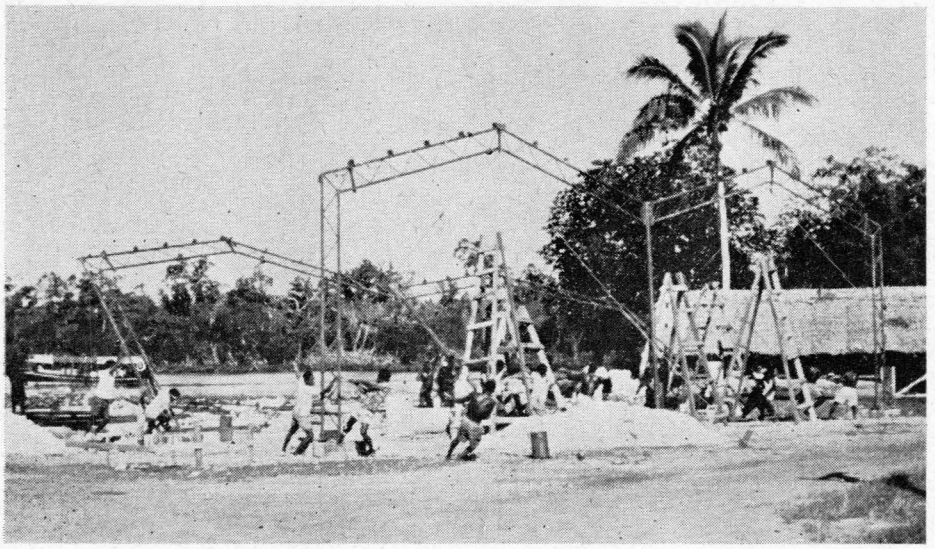
THE full story of the Boatbuilding Course held at Auki is a fascinating one. Although it only got under way in the practical sense in 1960, the idea for the Course was first advanced in 1957.

Practical considerations animated the Commission. Lack of suitable vessels had been a limiting factor in the development of inter-island trade and local fishing industries. The Commission foresaw that a group trained in boatbuilding would provide skills that could be applied to help expand the number of craft needed, stimulate trade and fishing, and train others. The Commission at its seventeenth session in that year approved proposals to seek the assistance of international organizations towards the holding of the Course and for the production of a manual on boatbuilding written for islands conditions.

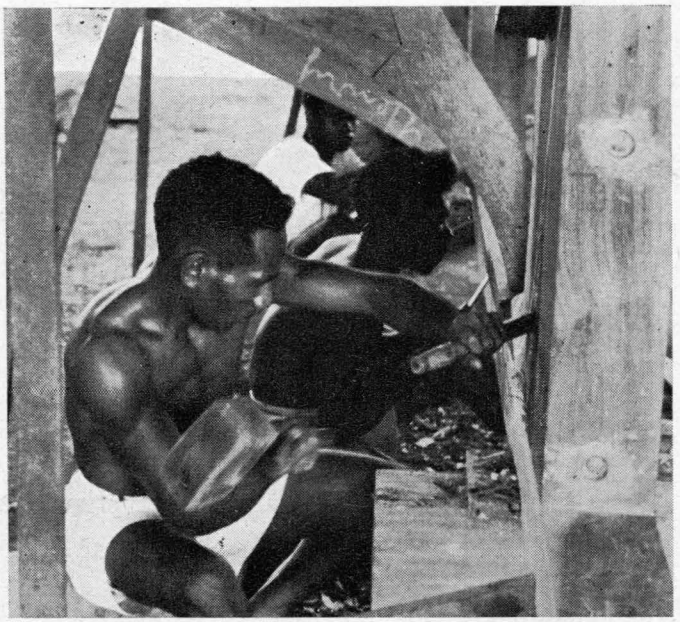
In the following year the Commission was able to approve final arrangements for the Course to open in the British Solomon Islands Protectorate in 1960. The site, at Auki on Malaita Island, some thirty miles from Honiara, the administrative capital—was chosen in consultation with the Protectorate Government, taking into account among other things the interest in, and aptitude for, boatbuilding shown by the people who dwell on artificial islands in the lagoon there.

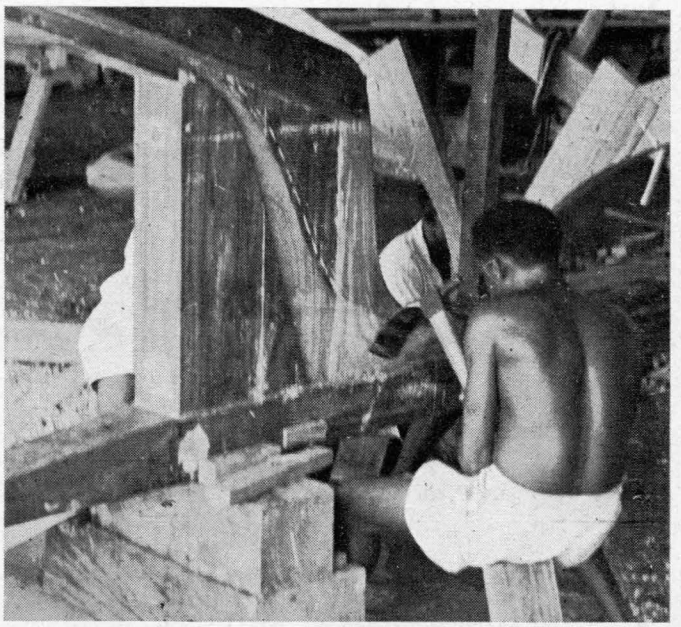
The arrangements made were that the Protectorate Government would provide the buildings (including house and furnishings for the Director-Instructor) and services such as power and water. The South Pacific Commission would supply the machinery, tool kits, and full sustenance costs of the students for the duration of the Course, plus personal allowances for out-of-pocket expenses. The United Nations Technical Assistance Board would recruit the Director-Instructor and pay his fares as well as half of the return fares of participants (territorial governments themselves meeting the other half).

Meanwhile, it had been arranged that a well-known naval architect, Mr. Arthur N. Swinfield of Sydney, would prepare the boatbuilding manual, with appropriate plans and specifications for vessels to be constructed.



Students erecting the framework of the boatbuilding workshop.





Trainees at work with chisel and mallet (left) and adze (right).

Uncertain Start

Eventually, in late June and early July, 1960, the twenty-four participants joined the Director-Instructor, Mr. Cecil R. Fisher, at Auki. Mr. Fisher had had many years of boatbuilding and instructional experience in Papua and New Guinea, where he had built or worked on vessels ranging from small harbour craft to 300-tonners.

The students came from Papua and New Guinea, West New Guinea, the Gilbert and Ellice Islands, the British Solomon Islands Protectorate, the New Hebrides and the Trust Territory of the Pacific Islands. As their workshops and quarters were still incomplete when they arrived, they helped to finish them. In the evenings they attended lectures, discussions, and demonstrations organized by Mr. Fisher. Materials and equipment were assembled progressively.

The Course was officially inaugurated on August 31, 1960, by the former British High Commissioner for the Western Pacific, Sir John Gutch.

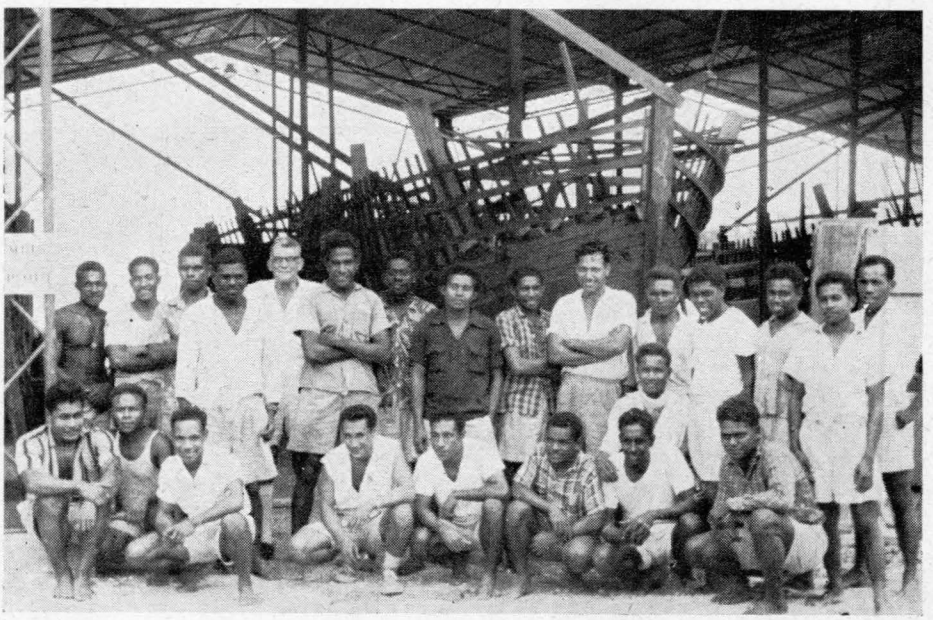
The original programme called for three 25′ fishing vessels to be built to a design by Mr. Swinfield. Starting from "scratch", the students worked right through from start to finish. They even selected for their needs suitable hardwood trees standing in the forest, felled and trimmed them, floated the logs to the workshop slipway, hauled them up, cut them into planks with a pit-saw, and, lastly, kiln dried and air-seasoned them. As the Director-Instructor commented in one of his reports, they followed their job from "standing tree to finished size".

The Director-Instructor's monthly reports over the two years of the Course tell an inspiring story—free of "officialese"—of unflagging enthusiasm, of disappointments, frustrations and triumphs, of character-building through self-discipline, good example and the wise devolution of responsibility, of the way that mutual respect and affection developed through determination and co-operation in a common task, and of how technical skills and "know-how" were grafted on to natural aptitudes.

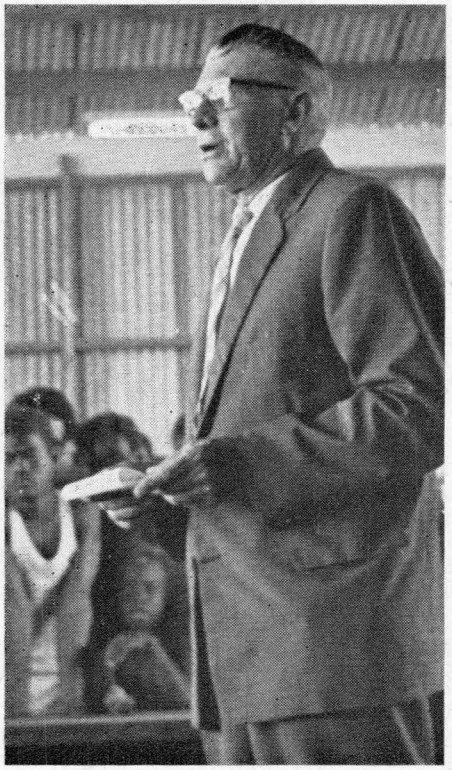
First Launching

The first great milestone was the launching of the first craft on July 13, 1961. It was followed down the slipway by the remaining two, in quick succession. Appropriately, all three were destined to be used in the first place for an intensive fisheries training course for Pacific students organized by the South Pacific Commission and, once again, assisted financially by the United Nations through the Food and Agriculture Organization. As the High Commissioner said at the launching ceremony, the school itself provided training for one industry and the results were able to provide training for another.

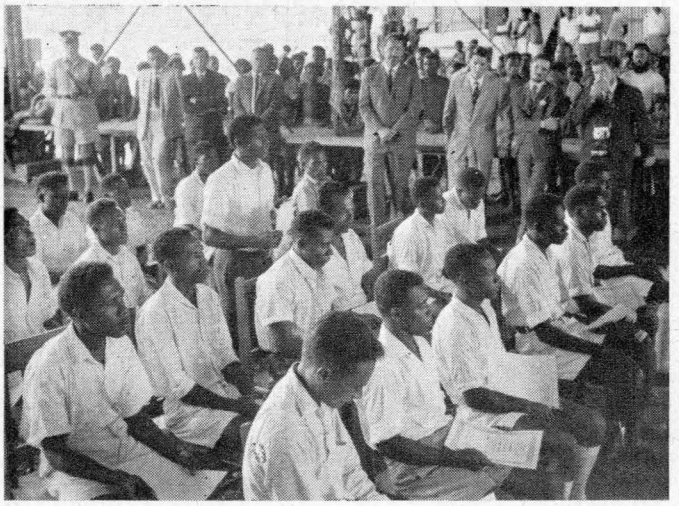
The next exercise was the construction of four 25′ touring vessels, with some different and more complex features than the original fishing craft. Two of these were launched before the Course closed on September 8, 1962. The re-



Twenty-four islanders from six South Pacific territories were welded into a happy and efficient team by their instructor, Mr. Cecil Fisher (standing fifth from left).



Speaking at the closing ceremony, Mr. Fisher told students that they had learnt more in two years than most apprentices do in four.



Nawarisa Bauw, of West New Guinea, replying to speeches on behalf of the students.

maining two, now well advanced, will be completed by the trainees who will attend a new Course, to begin at Auki around March.

Apart from building new craft, the trainees received training and experience in the repair and maintenance of engines and hulls.

An indirect result of the Course was the keen interest with which local inhabitants of and around Auki followed every facet of it. One group was reported to have studied every move as the first three fishing boats were building and even purchased the plans from which, with some technical assistance and advice from the Director-Instructor and his trainees, they constructed their own vessel.

Closing Ceremony

Certificates were presented to the students at the closing ceremony on September 8, 1962, by His Excellency Sir David Trench, K.C.M.G., M.C., High Commissioner for the Western Pacific. A large crowd of local people and visitors attended.

In his address Sir David referred to the joint efforts that had made the Course possible. He said that all who had participated in the setting-up and running of the School could congratulate themselves on the success of a bold and imaginative experiment.

Sir David especially thanked Mr. Fisher for all he had done to ensure the success of the School. He said that it was very much Mr. Fisher's creation and his spirit had animated it. He had gained the admiration of everyone for what he had achieved.

Sir David asked the dispersing students to remember the friendships they had made, the different points of view they had exchanged, and the similarities they had discovered between themselves. All of this was almost as valuable as the techniques they had learned at the Course which had been, as was intended, an essentially practical course of instruction and a very good demonstration of the virtues of learning by doing.

Dr. J. Barrau, Executive Officer for Economic Development, representing the South Pacific Commission, told the gathering that not only had the Course been a technical success but it had been also a demonstration of international co-operation. It had prompted efforts to extend training in boatbuilding, and it was planned in 1963 to open a second two-year course at Auki and a new course at Nouméa in New Caledonia.

Dr. Barrau said the Commission's hope was to expand in the future the number and range of its training centres, courses and study groups, not only to provide training in fields of interest for the whole South Pacific region, but also to promote closer contacts and co-operation between islanders of the various territories.

Dr. Barrau thanked the Government of the British Solomon Islands Protectorate and the people of Malaita, whose hospitality and interest had been a consistent and valuable encouragement. He joined His Excellency in paying tribute to the leadership and enthusiasm of Mr. Fisher.

In a brief final address directed to the students, Mr. Fisher referred to the uncertainties and anxieties they had all felt at the beginning. These had been overcome through practical hard work, and in the two years of the Course the students had learned more than most apprentices would in four years. He urged them to continue to learn, and always to apply themselves cheerfully and patiently, however hard the task.

Mr. Nawarisa Bauw, of Fakfak, West New Guinea, replied to the speeches on behalf of the students. He thanked the High Commissioner and his officers in the British Solomon Islands Protectorate

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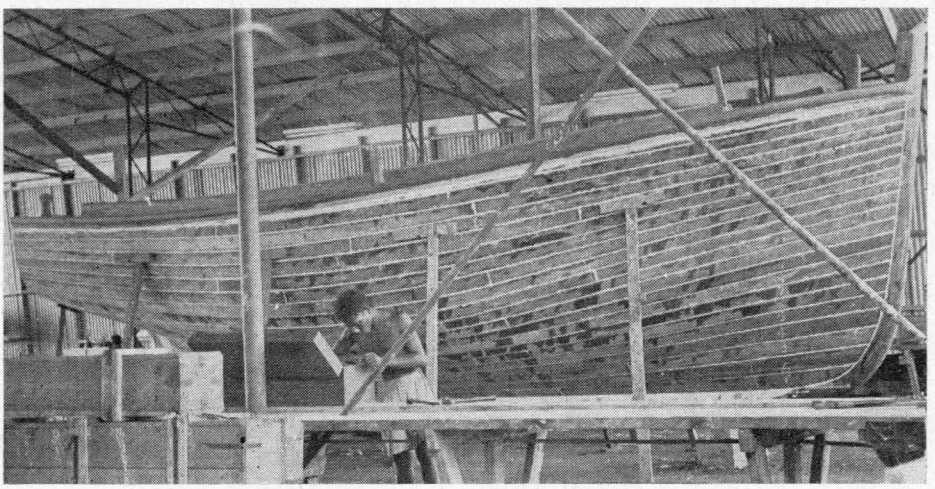
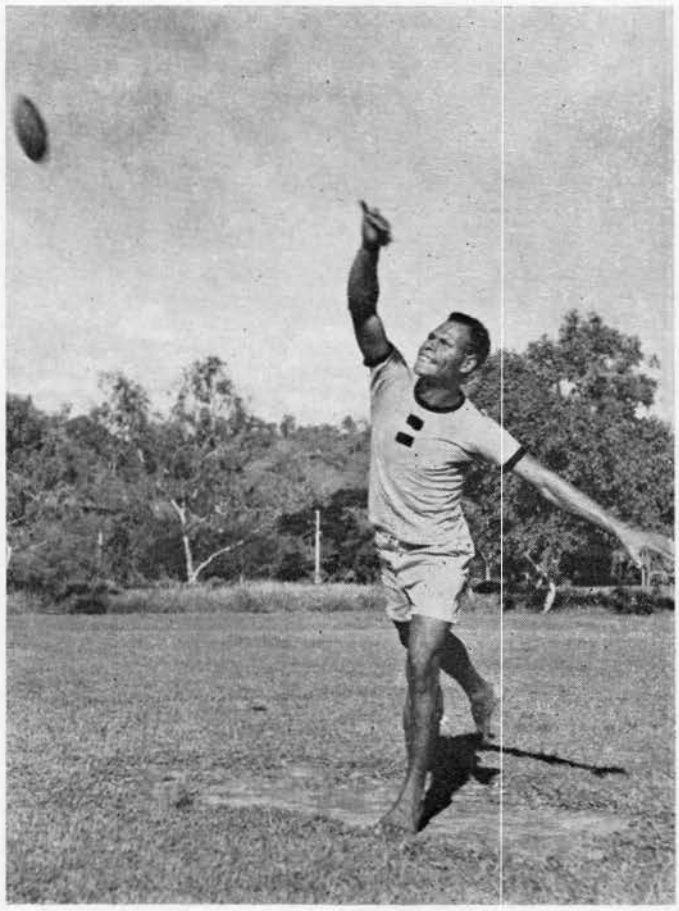


The same basic hull design was used to build four fishing and general purpose vessels, and four touring launches.



Eliuda Nason (above) and Kevin Haraha at high jump and discus throwing practice at the Ward's Strip Teachers' Training College outside Port Moresby.

Fiji Prepares For First South Pacific Games

Interest throughout the Pacific is becoming focussed increasingly on Fiji, where the first South Pacific Games will be held from August 29-September 7 next. More than six hundred athletes are expected to attend.

By E. J. F. HACKETT*

TO Fiji has fallen the honour and responsibility of organizing the first South Pacific Games, which will be held in Suva from August 29 to September 7 next.

It is three years since the idea of the Games was suggested to the fourth South Pacific Conference at Rabaul. It was received enthusiastically. Eighteen months later—in March, 1961—delegates from nine South Pacific territories met at SPC headquarters in Nouméa and drew up a draft charter for the Games. Fiji was invited by the other eight countries to be the first host territory.

Generous Support From Fiji Government

To stage the Games effectively, Fiji will spend upwards of £F30,000. Generous support is being given by the Government of Fiji, which has already made grants totalling £21,600. Most of this has been spent on making Suva's Buckhurst Park—a main centre of sporting activity—a fit arena for the Pacific gathering.

Nearly £5,000 has been spent to improve the running track. The existing covered stand has been supplemented by a new one, which will seat an additional 800 spectators. Extra showers have been provided for the athletes, two floodlit basketball courts have been constructed, drainage has been extended, and there have been a number of minor improvements.

Other financial help is coming from the South Pacific Commission—which is providing £stg.3,100 for equipment—while an appeal is being made to the public of Fiji for £10,000 for other expenses. It is hoped that most of this sum will be realized from two giant lotteries, with first prizes of £3,000 each, that have been organized.

Games Programme

The programme for the Games includes athletics and swimming for men and women, boxing, hockey, indoor basketball, bowls, volleyball, Rugby and Association football. Women's events will include basketball. Golf, tennis and table tennis will be organized on a mixed-team basis for men and women.

Not very long ago, golf might well have been regarded as a purely European game, unsuitable for the South Pacific Games. However, in recent years, Fijians and Indians in Fiji have taken up golf enthusiastically, and some of them are among the best players in the Colony.

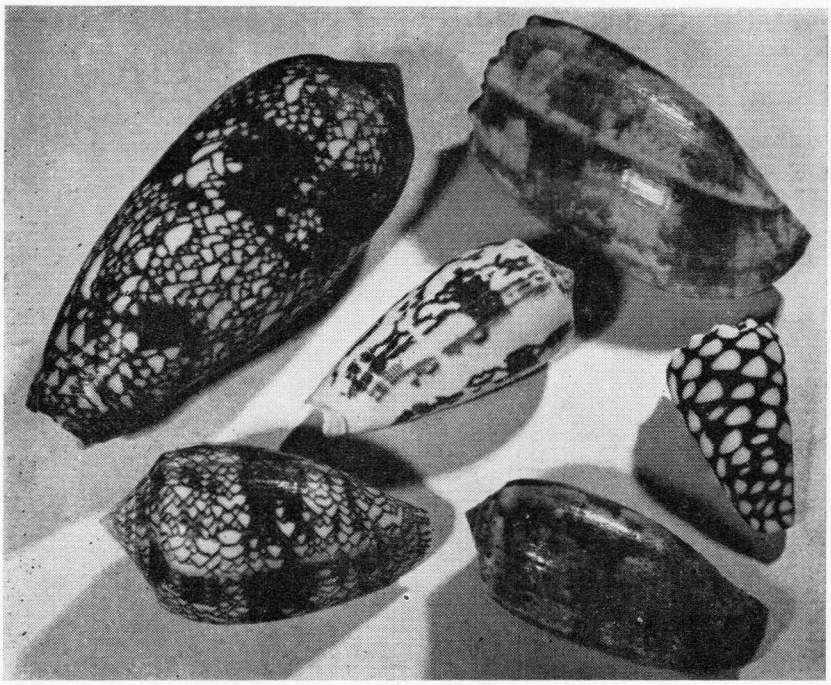
Interest Growing Rapidly

Interest in the Games is spreading rapidly throughout the Pacific Islands. Some territories that previously had no amateur sporting organizations are forming them in order that they may take part in the Games.

It is now known that, besides the Fiji competitors, there will be entries from French Polynesia, Tonga, New Hebrides,

(Continued on page 36)

* Public Relations Officer, Fiji.



The six most lethal cone shells are pictured above. From bottom left corner, clockwise: **TEXTILE CONE** (Conus textile), **COURT CONE** (Conus aulicus), **GEOGRAPHUS CONE** (Conus geographus), **MARBLE CONE** (Conus marmoreus), **TULIP CONE** (Conus tulipa). Centre: **STRIATED CONE** (Conus striatus).

Cone Shells Can Be Killers

Certain species of cone shells commonly gathered on reefs throughout the Pacific for food and for shell collections can bring paralysis and even death to the unwary. Six of the most lethal are described in this article . . .

by ROB WRIGHT*

IN this age of jet aircraft, orbiting satellites, manned spacecraft, long-range missiles, hydrogen bombs, and "the twist," it is not surprising that in an endeavour to escape from the realities of these rather disturbing spectres, many of the world's people turn to gentle forms of recreation. Thousands devote their leisure hours to angling, others to horticulture; hundreds spend hours snorkelling in the sea, and there is an ever-growing corps of "do-it-yourself" fans. These and many allied hobbies which are soothing to the nerves and sometimes rewarding, require small expenditures of cash and time.

To many people, shell collecting is a soul-satisfying hobby providing a combination of outdoor life, interest, variety, and beauty that is hard to equal. But collecting sea shells is certainly not a new form of recreation. It has been popular for many years. In recent times, however, this band of men, women, and children, has grown phenomenally. And it is easy to see why this occupation is so popular. It is a hobby which can be followed by almost anyone, almost anywhere, and at almost any time. Dwellers in the Pacific, with its hundreds of islands and vast areas of coral reef, are perhaps more fortunate than others, for on these reefs and associated regions of sand and mud-flats, thousands of sea shells in every form and colour exist.

Women trochus divers on a reef off the coast of Vanua Levu, in the Fiji Group. They spend several days on the reef, sleeping in hollows scraped in the sand and coral. It is in areas like this that cone shells are to be found.

Cowries And Cone Shells

High on the list as a favourite group of marine shells are the cowries, because of their polished enamelled surfaces and beautiful colour patterns. They are many and varied, and at least one shell—the comparatively rare golden cowrie—commands a high price among serious collectors.

Next to the cowries comes the most beautiful group of gastropod molluscs in the sea—the cone shell family. A gastropod may be defined as one of a class of invertebrates whose distinguishing characteristic is a broad muscular organ —a foot—with which it propels itself. In other words, a cone is a type of marine snail with a house on its back. These conically-shaped shells exhibit a scintillating array of colours and patterns to catch the collector's eye, and are widely distributed from the Hawaiian Islands southwards through Polynesia, across the entire tropical Pacific to Indonesia and the Indian Ocean.

But it is a strange quirk of Nature that when she fashions beauty, she sometimes links it with danger, and occasionally with death. Examples of this are

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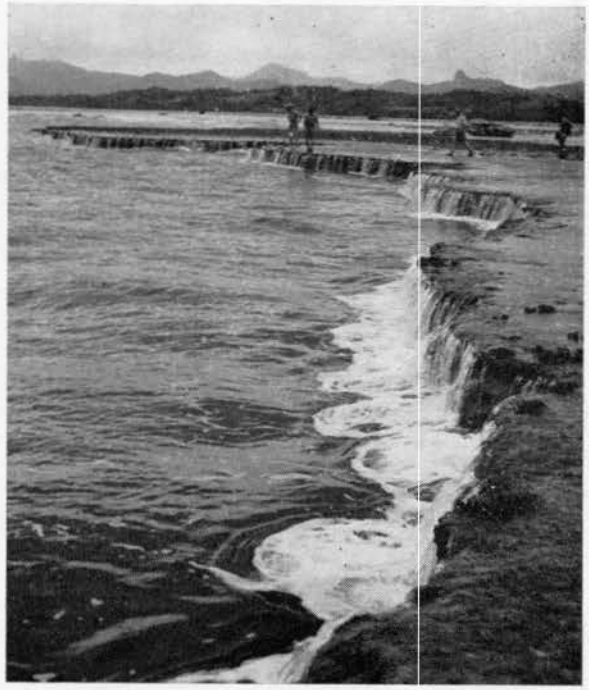
* Mr. Wright, who is the official photographer attached to the Public Relations Office in Fiji, also conducts a popular Saturday feature for amateur fishermen in the FIJI TIMES entitled *Hook, Line And Sinker.*

Above: A reef area near Suva which is a favourite hunting ground for shell collectors.



Edge of the main fringing reef near Suva on which many varieties of cones and other shells are found.

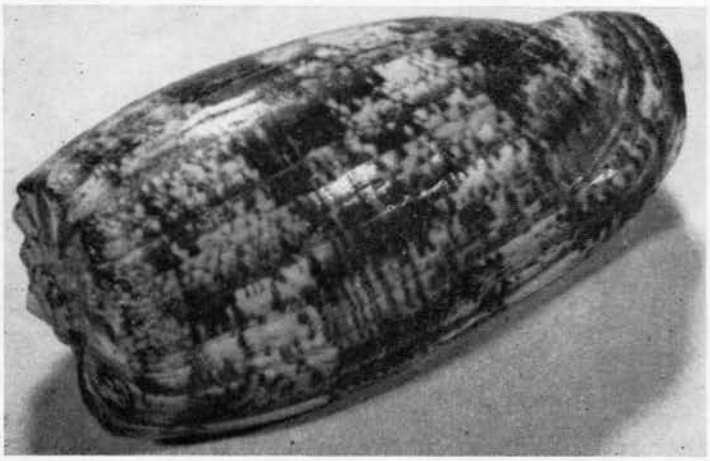
to be found nearly everywhere. For instance, among a myriad of exotically-beautiful fish found in the undersea world, there is none more attractive than the lion or turkeyfish, with its dainty pectoral fins extended like the wings of a bird. Yet excruciating pain will result if a finger is pricked by one of these appendages. Similarly, in the forests of South America grows a magnificent flower which is nothing but a living trap for small birds and animals which are engulfed in its colourful petals.

And so it is with some of the most attractive members of the cone family. By inflicting a tiny wound and pumping virulent poison into it, a cone can cause paralysis and death to man, mollusc, and fish—often within a few seconds.

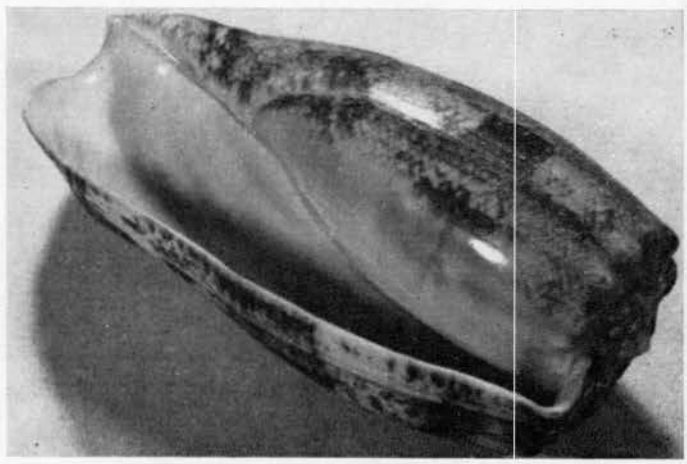
Within the gullet of the animal which lives in the deadly cone—an attractive shell that can reach upwards of 5″ in length—are a series of tiny glass-like hollow spears approximately 5/16″ long, each fitted with a barb that will enable the dart to become transfixed into the flesh of its prey. Connected to the dart is a poison sac operated by a gland. The sac contains a poison of a most virulent type.

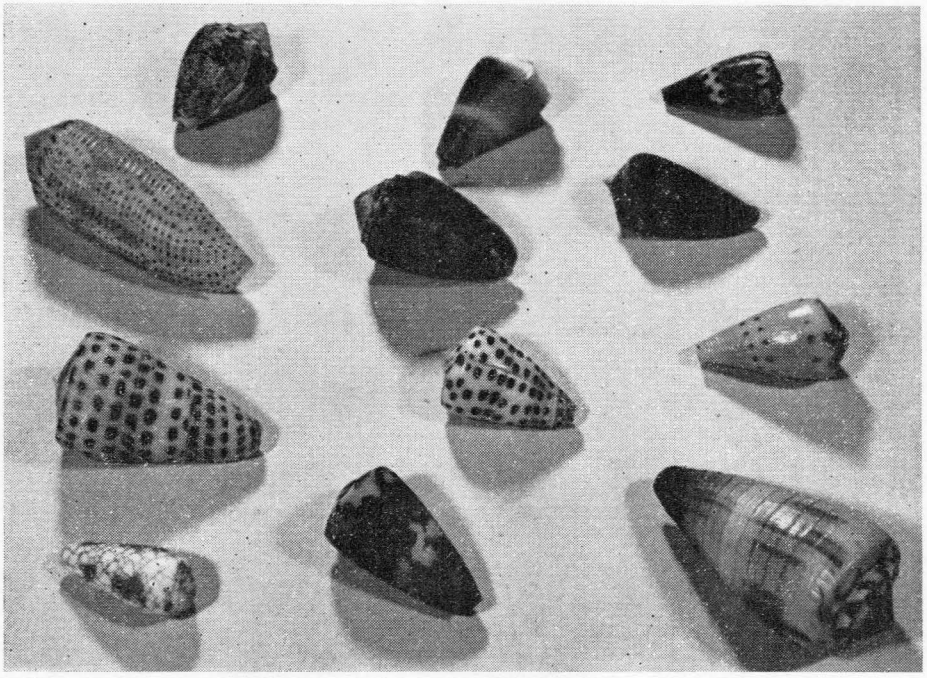
In much the same manner as a hunter who slips a cartridge into the chamber of his rifle, a cone when searching for food or in danger, slips one of these highly poisonous darts into a proboscis which, sheathed with small tentacles, protrudes from the head of the shell. At the same time, another appendage—the siphon, directs water over sensory nerve within the body and, by this means, the animal is able to determine by the taste or smell of the water whether prey is nearby. If the quarry is a fish, the siphon, undulating like a cobra snake, determines the position of the prey and at the appropriate moment and with a lightning thrust, the deadly spear is shot from the proboscis into the victim with considerable force. In a matter of a few seconds the venom takes effect

Life-size picture of a Conus geographus, deadliest of the cone shells. This one is 4″ long; they may grow longer. The shell is oblong and thin of texture, and is coloured in faintly-stained flesh or washed-out blue shades blotched and reticulated with reddish-brown.



Aperture side of a Conus geographus. The aperture runs the full length of the shell, widening towards the narrow end. It is at this end that the proboscis emerges, and collectors should keep this part of the shell turned away from the body.





The joy of collecting cone shells derives mainly from the immense range of colours, patterns, and textures. There are over five hundred different types in the family. These small cone shells are not dangerous.

and the fish—now paralysed or dead—is drawn to the mouth of the cone along with the poison dart, which curiously enough is also taken into the digestive tract. A new spear from the bundle held in the gullet replaces this in the proboscis.

New Caledonian Dies Following Sting

The natives of most islands in the Pacific consider shellfish a delicacy, and thousands of molluscs are collected and consumed each year. In some groups, cone shells are regarded as gourmet fare, and presumably those who collect these shells know of the danger to which they are exposed. But obviously others are unaware of this. Take the case of Theophile Gnai of New Caledonia. The following report is from the December, 1961, issue of the *Pacific Islands Monthly:*

"Theophile Gnai, a New Caledonia farmer's labourer, died early in November, two hours after a shellfish of the cone family—*Conus geographus,* stung him in the palm of his left hand. Theophile worked at Pouebo, on the north-east coast of the island.

"He was out fishing with his employer's son in a motorboat and came up from a deep dive on the reef (diving for trochus) to tell his companion that the shellfish had stung him. He had the cone in his possession. He was taken ashore to the Catholic Mission dispensary where the nursing sister gave what help she could. But he died fifteen minutes later, exactly two hours after he had been stung. The nearest doctor was on the other side of the island, but on arrival all he could do was to pronounce death.

"The news of Theophile's death caused considerable consternation among Europeans and natives. Few of them knew that such dangerous shellfish existed in New Caledonian waters. However, New Caledonia doesn't have the killer shellfish on its own—far from it.

"Dr. D. F. McMichael, Curator of Molluscs in the Australian Museum, said that the shellfish probably existed throughout the South Pacific area, as well as in the Indian Ocean, as far west as Madagascar. 'Their poison is exceedingly toxic, and nothing has been done about developing an antidote,' Dr. McMichael said.

" . . . Cases of death have been reported from the Loyalty Islands, Fiji, Japan, and even Queensland. The death of a native in the Yaté district about two years ago is thought to be due to a *Conus* sting . . .

" . . . Following this report, the wonder of it is that there are not more accidents connected with these shellfish. Thousands are gathered yearly by reef hunters without accident. Very probably this is because the shellfish is picked up and thrown into a bag instead of being constantly held in the hands. These shellfish make delicious eating, but it is certain many New Caledonians will now look closely at what they pick up on the reefs."

Near-Fatality In Samoa

But there are others more versed in the ways of cones who sometimes make mistakes. Take Ron Pahl's experience. Ron is a young Australian on the staff of the Seventh Day Adventists Fulton College at Tailevu, Fiji. He is an expert diver and spearfisherman, but his greatest hobby is shell collecting, and during his period of residence in Fiji he has built up a very large and attractive collection of shells taken from the many reefs in the Colony. But like all avid collectors, he wanted to delve in out-of-the-way places seeking for rare and unusual specimens.

When accrued leave became due he decided to take a round trip to Tonga and Samoa to pursue his hobby in these island groups. Tonga was fruitful, and so was Samoa, but here he made one mistake—a grave one. He was careless in handling cone shells, and but for extreme presence of mind and prompt medical attention, it may have been his last.

The episode came about on a reef about a mile from the shore at Apia, capital of this newly-independent nation. Ron had found a nest of seven tulip shells—*Conus tulipa.* It was a veritable goldmine for a collector to find in one spot. Not anticipating such good fortune he had neglected to bring his collecting equipment from the ship, and in his eagerness to gather them before they spread, he tried to handle too many at the one time. He was well aware of the danger involved, but the thrill of his find overcame caution.

Finding one of the shells sliding off his left hand, Ron flicked it with his finger. The shell flicked back—with its tiny lethal spear. There was no sting and no pain, but the poison took effect immediately. The hand became as numb as though local anaesthetic had been used. Hastily a tourniquet was devised from the headstrap of a diving mask and wrapped around the arm above the elbow, and then with as much haste as possible over the coral, the journey to shore commenced.

During the twenty-five minutes it took to get from the reef to the township, the whole arm became numb and a feeling of constriction was felt in the chest. Ron was rushed to the hospital where the Medical Officer, Dr. Fisher, and his wife —also a doctor—prepared a possible antidote. Neither had had experience with shellfish poisoning, but as the symtoms were similar to those of snakebite, they tried a remedy which had been used successfully for this.

Into the afflicted member they in-

jected an anti-histamine. This was followed by an injection of adrenalin into the other arm. The constriction in the chest, which had grown steadily worse, vanished immediately and, after a period of observation, Ron was allowed to proceed on his way. The hand and arm were still paralysed, but two days later he was able to move the third and little finger slightly. After a fortnight, feeling began slowly to return to the arm and hand, but it was three months before he finally recovered full use of them. Even today—nearly six months after the incident—there is still a feeling of tightness in the muscles.

Main Symptoms Of Cone Shell Poisoning

The main symptoms of poisoning a victim experiences after being stung by a cone shell are acute burning pains and swelling, a local numbness which in severe cases rapidly develops into paralysis, loss of muscular control and of speech, and dimness of eyesight. Virulent symptoms may wear off after about twenty-four hours, but for days after victims still feel the effects, some weeks or months elapsing in some cases before the patient feels fully recovered.

Cones live mostly in holes and fissures in the rocks and coral boulders, where they prey on other molluscs and fish. Although the animals are normally timid, moving slowly about and shrinking into their shells at the approach of danger, they nevertheless have this very effective means of defence.

The shells should never be placed in their living state on the hand with the shell aperture facing downwards, but if they must be handled, it is best to hold the broad part of the shell, pointing the narrow end away from the hand or body. To ensure complete safety, tongs should be used to handle the shells, which should be carried in a tin or similar receptacle with tight-fitting lid.

The Six Most Lethal Cones

The killer cones are limited in number, but the entire cone family includes more than five hundred species, most of which make their homes in the warm waters of the Pacific. The smaller cones are relatively harmless.

The shells of these molluscs are all conical in shape and have the narrower end directed towards the front of the animal. The shells themselves are usually heavy and porcellaneous in make-up, with the aperture extending the full length of the shell.

Following are the names and descriptions of six of the most lethal cones:

MARBLE CONE (*Conus marmoreous*). The best known of the stronger cones, and the most striking looking. Very heavy, solid, and smooth. Marbled all over with black and white triangular shaped spaces.

TULIP CONE (*Conus tulipa*). This species inflicted the wound on Ron Pahl. Is known to have wounded other people. Pretty, long, less solid than the others. Purple brown or violet in general colouring, encircled with fine lines of white-spotted brown.

COURT CONE (*Conus aulicus*). Rather elongate, brown, crossed with numerous lines and ornamented with large unequal triangular marks. It is a recognized poisonous species of a virulent nature.

STRIATED CONE (*Conus striatus*). Cylindrical in shape. Colour is white stained with pale rose, variegated, streaked and mottled with black.

GEOGRAPHUS CONE (*Conus geographus*). This species killed Theophile Gnai and a number of other people. It appears to be the most virulent of cones. Large oblong and thin of texture. Faintly stained flesh or washed-out blue shades blotched and reticulated with reddish-brown.

CLOTH OF GOLD (*Conus textile*). Best known of all cones. Shell is ovate, smooth and striated towards base. Reticulated all over with orange-brown forming triangular shaped white areas. Has been responsible for many cases of poisoning.

Perhaps the most mitigating knowledge which cone collectors can store in their minds is the fact that there is a standing offer of an extremely high price for a perfect 5″ specimen of the *Conus gloriamaris*—said to be the rarest shell in the world.

First SPC Secretary-General Re-appointed

MR. W. D. FORSYTH, O.B.E., an Australian who from 1949-1951 held the position of first Secretary-General of the South Pacific Commission, has again been appointed to the post eleven years later, for a five-year term.

Mr. W. D. Forsyth.

Mr. Forsyth, who holds the degrees of M.A. (Melb.), B.Litt. (Oxon.) and Dip.Ed. (Melb.), has had a distinguished and varied career with the Australian Department of External Affairs, where he is at present Assistant Secretary. He is fifty-three, married, with two daughters and one son. He will take up his new post next March after the present Secretary-General, Mr. T. R. Smith, has completed his five-year term of office and returned to Government service in New Zealand.

Mr. Forsyth has been associated with the South Pacific Commission from its inception. He assisted in drafting the Agreement establishing it at the Canberra Conference held for the purpose in 1947. As the Commission's first Secretary-General he set up its headquarters in Nouméa in 1949, recruited, organized and directed the international Secretariat, supervised the work programme, organized the first South Pacific Conference at Suva in 1950, and generally administered the launching of the Commission as a going concern.

After leaving the Commission's service in 1951 Mr. Forsyth resumed duty with the Department of External Affairs in Canberra. From 1951-1955 he was Minister and Permanent Representative of Australia at the United Nations headquarters in New York and Australian Representative on the Trusteeship Council. In 1956 he returned to duty with the International Organizations and Economic Relations section of his Department at Canberra. From 1959-1961 he served as Ambassador to Vietnam, and Minister to Laos (to 1960).

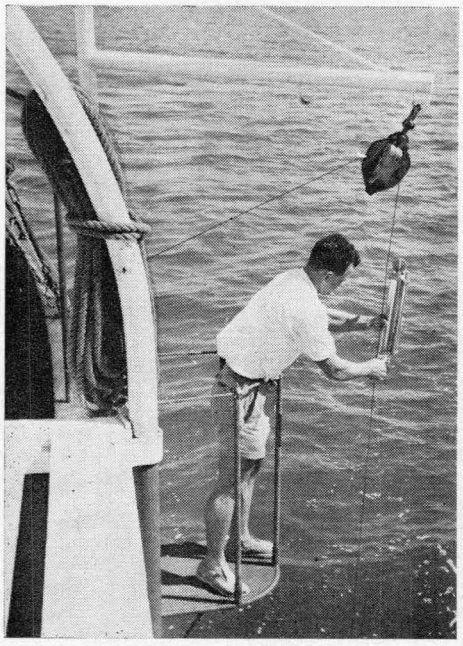
School For Boatbuilders

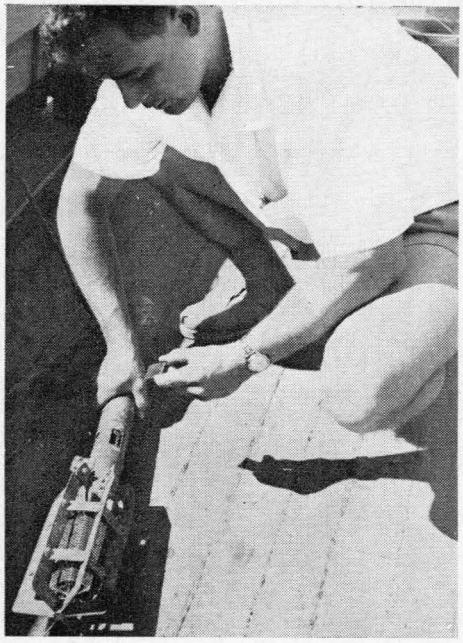
(Continued from page 22)

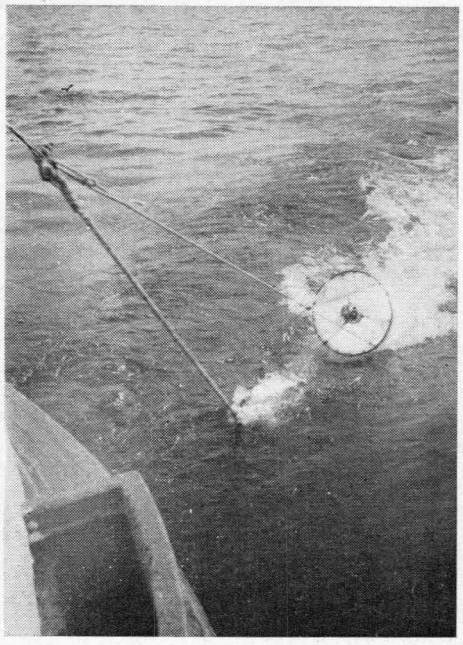
for their practical interest and co-operation at all times, and the members, Secretary-General and staff of the South Pacific Commission, whose efforts had resulted in the establishment of the Course. The students would show their appreciation of all that had been done for them by faithful service in the future, and by passing on to others what they themselves had gained. They all paid tribute to Mr. Fisher for his excellent leadership and guidance. They owed him much for the help he had given them, from beginning to end.

Two Further Courses

The success of the Auki Course has been so outstanding that two new courses will begin in 1963, one at Auki and the other at Nouville, near Nouméa, New Caledonia.







Above: Reversing bottles are put out; they bring back samples of water from different depths, and carry thermometers. Centre: The bathythermograph provides a continuous record of the temperature at a given point, from the surface down to a depth of around one thousand feet. Right: A plankton net is hauled on board. It carries a flowmeter, which enables scientists to relate the sample to a given volume of water.

Oceanographic Research In The South Pacific

The oceanographic research programme being carried out in the South Pacific by the INSTITUT FRANCAIS D'OCEANIE *from its headquarters at Noumea is briefly reviewed below by . . .*

MICHEL LEGAND*

AT present, the programme being carried out by the oceanographic specialists of the French Institute of Oceania (I.F.O.) is at a most important stage of development. Although it has made considerable progress in the last few years, it will not reach its full expansion until 1964.

The *"Orsom III* work programme" as well as the "future programme" are based on some fundamental principles.

First of all, the Laboratory of Physical Oceanography and the Laboratory of Marine Biology at the Institute are united, both administratively and also because all their efforts are directed towards one main programme. They are endeavouring to obtain as much information as possible on the cycle which leads from the structure of water masses to the biology of their large and small inhabitants.

Another essential aspect shows scientifically that the efforts of the physicists and biologists have been united: the object has always been to obtain as many results as possible by synthesis, and to understand the inter-relation of all aspects of the programme. Also, emphasis has always been put on seasonal cycles.

Finally, one basic rule has been observed: all efforts have been concentrated on the problems of the high seas, which appeared to be most important, not only in themselves, but because of the resources they provide.

1: The "Orsom III" Programme

From 1956 to 1961 the fields of study were divided under a number of headings, as follows:

PHYSICAL OCEANOGRAPHY: Two research workers (Messrs. Rotschi and Magnier). Physics and chemistry of the water (determination of the characteristics of water masses, their distribution, the study of nutritive salts):

- Physical characteristics: temperature, salinity, dynamics.
- Chemical characteristics: oxygen, pH, carbonates, phosphates.

MARINE BIOLOGY: Two research workers (Messrs. Legand and Wauthy).[1]

- Phytoplankton: primary production, pigments, systematics.
- Zooplankton: quantitative distribution, diurnal cycle.
- Nekton: biology and fishing of tuna (yellowfin, albacore).

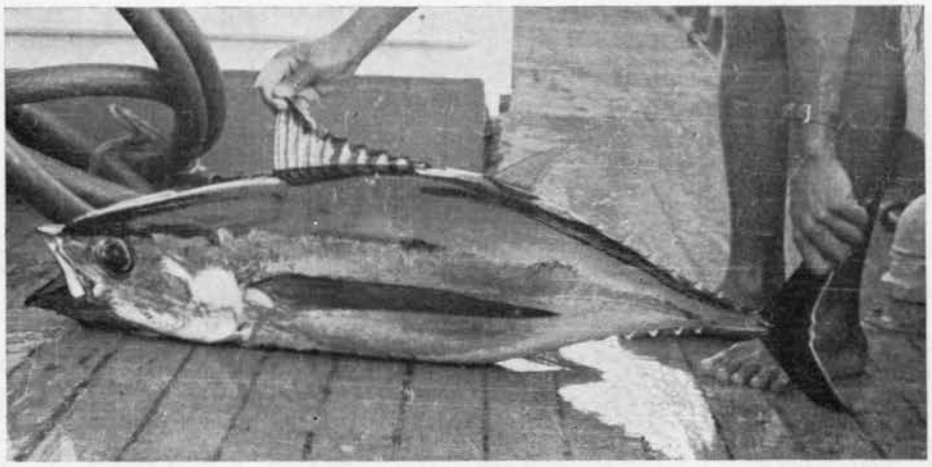
During 1962 this list was added to, since it has now become possible to start studying the marine life cycle from new angles, as follows:

—Micronekton. This is composed of the smallest organisms capable of swimming independently of currents (nekton) and which, together with the larger organisms which drift with the water masses (plankton), form the basis of the food of the larger inhabitants of the nekton, that is to say, fish which can be used for human consumption. It may be mentioned that the study of this micronekton connects the studies of the zooplankton to that of the nekton, through the intermediary of the stomach contents of tuna and other deep sea fish which have been surveyed and measured systematically for a number of years.

—Penetration and properties of light in water. Light is the most important element in the growth of phytoplank-

[1] A third marine biologist, Mr. Desrosières, is at present serving with the armed forces.

* Marine Biologist, French Institute of Oceania, Nouméa, New Caledonia.



The albacore, a major industrial resource of the South Pacific, is frequently taken by longline from the "Orsom III".

tonic life. It is, therefore, understandable that it is a most important factor of marine productivity. This is why the study of this question was undertaken as early as August 1962. This research work will enable us better to understand the relationship between the environment and its flora and fauna.

—If possible, the measurement of nitrates will be added to that of nutritive salts, which was previously limited to phosphates.

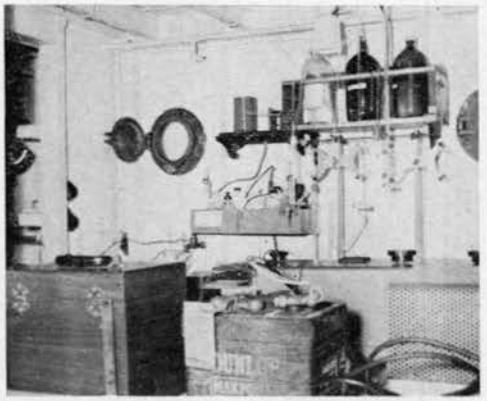
All this research work is carried out on board the *Orsom III*, which is a 75′ ship belonging to the Institute. This ship is equipped with a 133 sq. ft. laboratory, a small all-purpose winch with which hydrological samples can be taken to a depth of 4,000′, and biological samples to a depth of 660′, and all the equipment required for Japanese longline fishing, with eleven sea miles of line (approximately 400 hooks).

Apart from its crew, the ship can carry four research workers or technicians and cruise for fifteen to twenty days. This is obviously not a large oceanographic ship, but nevertheless she is reasonably well equipped for her size. The area over which the programme can be carried out is restricted, however, by the size of the ship: it ranges from the Solomon Islands in the north, to the New Hebrides in the east, to Norfolk Island in the south, and in the west to 157°E. Roughly, it covers the north-east area of the Coral Sea.

This explanation of our working facilities and of the main lines of the programme now enables us to give a description of what has been achieved dur-

Right, below: Filtered through special sieves, the samples yield phytoplankton cells. The pigments, which will be extracted later, will enable a tentative evaluation of the amount of phytoplankton.

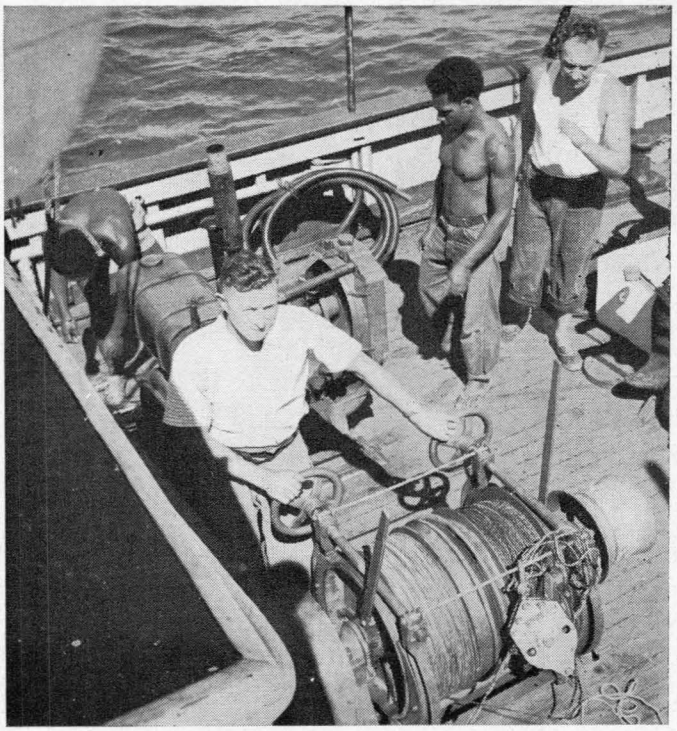
The "Orsom III" leaving Noumea for a cruise. A larger, more modern vessel to replace her is now being built at Dieppe, France.



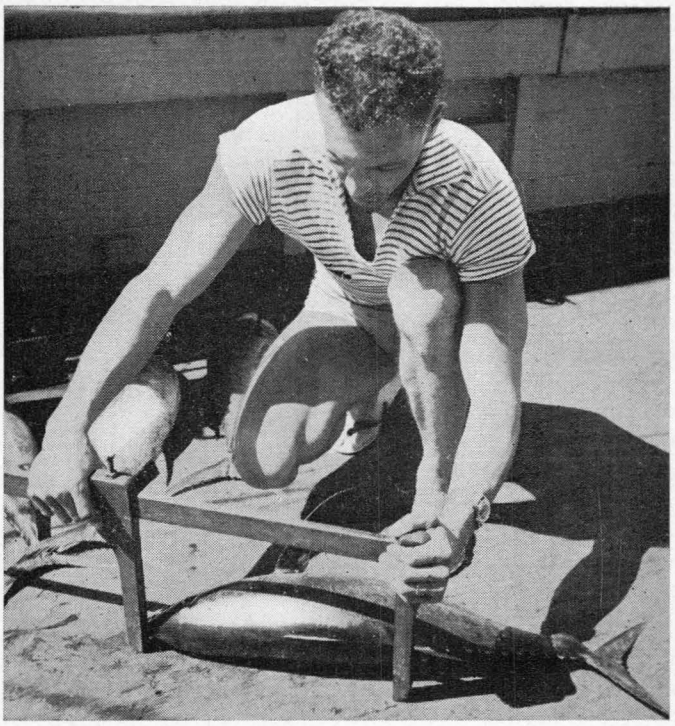
Right, top: The "Orsom III" laboratory. In the foreground is a pH meter.

The reading of temperatures obtained at different depths must be carried out with the greatest care.

A complicated and delicate electronic apparatus is used to measure pH values and the phosphate content of water samples.



The oceanographic winch on "Orsom III" in action.



The measurements of tuna provide data for numerous biological studies.

ing five years of work at sea and in the laboratory. We now have sufficient background information to attempt a review of the implementation of the projects laid down in 1956.

Roughly, the *Orsom III* has enabled us to obtain a fairly accurate picture of some of the main marine features in the north-east area of the Coral Sea, together with some important isolated results. Essentially these comprise the studies related to the so-called Solomon divergence, which has created one of the richest fishing areas in this region.

These studies include hydrological research work and research on primary production, phytoplankton, zooplankton and even microplankton; work on the relation between various chemical factors or their distribution (pH, oxygen, phosphate); studies of the rhythm of the diurnal quantitative variation of the zooplankton in all the area; research on the biology of two industrially important tuna species—the albacore and the yellowfin (timing of the spawning season, determination of quality of the stock, feeding, balance with other elements of the deep-sea nekton).

This list is, of course, very general and incomplete, and we do not intend to go into any details, but it does give an idea of the synthesis which we are endeavouring to achieve. It follows the feeding from the tuna back to the chemical factors which "condition" the phytoplankton, and also attempts to integrate the links of this chain within their physical environment.

This discussion of our aims and of the results achieved would be incomplete if we did not mention here that these are very often linked with international research work, which has increased their value.

In some cases it has been a precise international project employing the ship and all its personnel. At other times we have lent research workers to take part in the activities of a foreign team. These were the Equapac cruise in 1956, which grouped ten ships engaged in research work in the equatorial and tropical Pacific, and the participation of French research workers in the Australian cruise carried out late in 1962 to study micronekton west of Australia.

In other cases it was found that the research work undertaken at Nouméa coincided with a particularly well-defined trend of several other oceanographic programmes in the Pacific, which definitely called for international co-operation. Two examples are research on primary production, and also the biological research on the species of tuna which may be caught with a long-line.

Finally, on a more regional level, we maintain constant relations with our Australian colleagues from C.S.I.R.O. in the study of the Coral Sea.

However, there is a negative side to this picture, since we have had to give up temporarily some of our objectives. The definition of seasonal variations of cycles and resources, and the quantitative distribution of the larger elements of the nekton (particularly tuna) at a regional level, are the two main fields in which we failed.

In the latter case, for instance, the only thing we have found out is that the area as a whole is extremely rich. This fact needs to be investigated more thoroughly, since its details are essential prerequisites to the development of industrial fishing.

These gaps are due directly to the limitations imposed by the small size of the *Orsom III* which have not enabled us to carry out deep-sea observations as regularly or as often as we would have liked, and also our means of obtaining samples on board the ship have been too limited in weight and depth. Quite often the area covered has not been sufficiently large for us to obtain complete understanding of the problems with which we were faced.

The logical conclusion of the above explanation is very simple: *Orsom III* has enabled us to prove that the research programme and the results which could be obtained are useful. Nevertheless, the ship is aging. She will have to be replaced, and we are considering a larger and better-adapted vessel.

2: The Future Programme

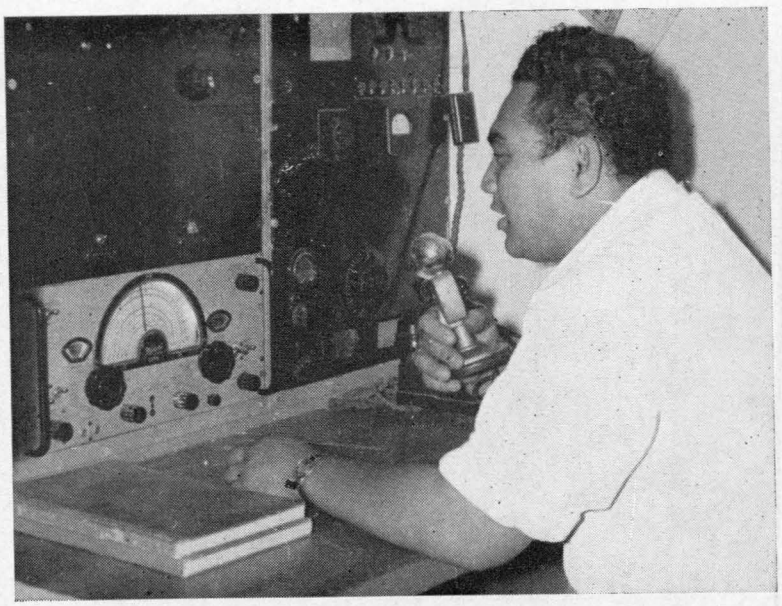
This leads us to describe our new ship and the broad lines of the programme which we are hoping to carry out as from 1964. The importance of the results obtained by the *Orsom III*, and the unfortunate limitations of our work due to her size, were sufficiently convincing, and an agreement was reached in 1960 without too much difficulty for the

(Continued on page 71)

Cook Islanders Calling . . .

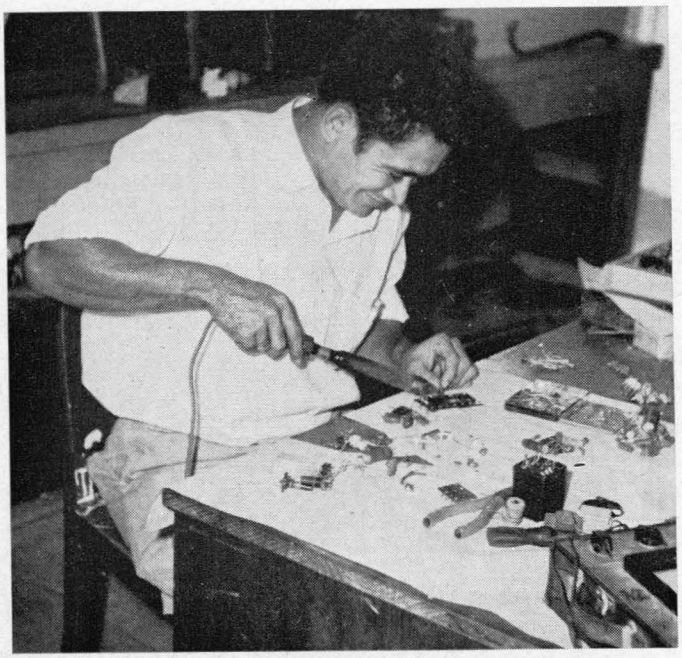
In recent years, more and more Cook Islanders have taken up amateur radio as a hobby. The Rarotonga Radio Club runs regular classes for beginners, and a summer camp, and the number of its transmitting members is growing steadily.

By STUART KINGAN



The chairman of the Rarotonga Radio Club, Teau Aiturau, operating the Club Station — ZK1BO.

KEEN interest has been taken in amateur radio in the Cook Islands since the end of the second World War, when three licences and call-signs were issued. ZK1AA was allotted to the writer,



Noora Tangaroa (ZK1BW) building a receiver.

"Hams" of the future.

ZK1AB to Gordon Hitch—a Royal New Zealand Air Force radio operator then stationed in Rarotonga—and ZK1AC to Jim Shortall, at that time Captain of a Cook Islands ship, and, more recently, prominent in Pacific journalism.

All were very active as amateurs, Gordon Hitch in particular making history by his contacts several times daily with the Kon Tiki expedition during practically its entire voyage.

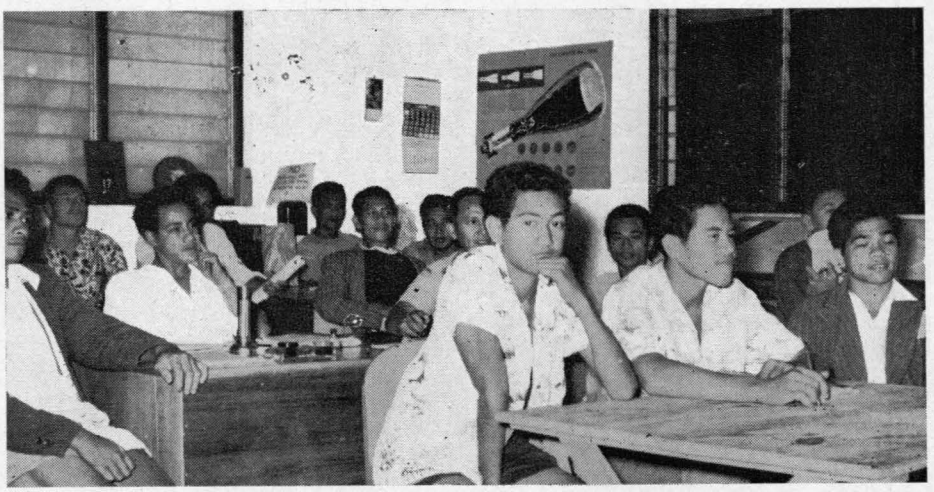
Many more joined the amateur ranks later, but nearly all were Europeans on short tours of duty to the Cook Islands. One local European — Fred Story, ZK1AG—and one local Cook Island Maori, David Evaroa, ZK1AH, who is now in New Zealand—were for many years the only local amateurs. Yet local interest in the hobby was considerable, and several times classes were started for groups of interested people.

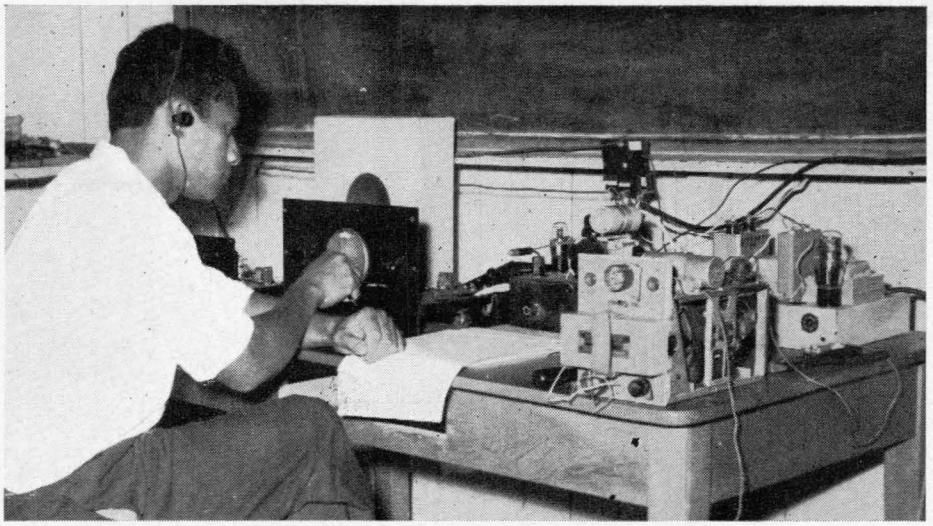
Classes Started For Youth Clubs

In 1958 several young men's clubs expressed interest, and three local amateurs—Bob Wilson (ZK1AD), Bill Martin (ZK1AJ) and the writer (ZK1AA) —started regular lecture visits to two youth clubs. Other clubs asked for assistance, but these additional requests were too much for us to handle.

Considerable elementary progress was made during the year. However, Bob Wilson and Bill Martin left at the end of 1958, and this left me with the rather impossible task of going out almost nightly to give lectures. The alternative was to bring members of youth clubs who were interested into a special class in Avarua.

As part of its policy of actively assisting youth clubs, the Administration had earlier agreed to provide transport to and from villages for lectures, and so one night each week a truck went round the villages to collect amateur radio enthusiasts for a central class. For the





Rau Maeva (ZK1BR) operates a portable station from a Club camp.

first few weeks between twenty and thirty attended, but later the number dropped to an average of about eighteen.

The biggest difficulty encountered was a general lack of knowledge of mathematics and science; relatively few boys in these islands have had a secondary education. As a result, very little time was devoted in the first-year classes to radio and electricity. Instead, we concentrated on the making of accurate measurements, the reading of scales, fractions, decimals, square roots, logarithms, trigonometry, statics and dynamics.

Practical training in electricity and radio was given from the start, however, and by June 1958 the Radio Club commenced operating its first transmitter under the call-sign ZK1BO. From then on, members obtained operating practice, and they began to take a much greater interest in amateur radio and to appreciate more fully what this unique hobby can offer. Morse practice also proceeded at regular intervals, mainly under the supervision of several members of the class who had already become moderately proficient at sending and receiving.

Successful Summer Camp

In January 1959 the Club held its first summer camp. This was a rather unique event. Twelve members of the Club and I spent a week at Titikaveka village, about ten miles from Avarua. As it was during the school holidays we were able to borrow the school buildings, and in one of these a workshop was set up. No completed radio equipment was taken to the camp—only components—the idea being that anything used at the camp should be built there.

Before the camp ended, three receivers and three transmitters were working. One transmitter was operating on morse on 20 metres, and was used to communicate with many overseas countries, the most distant being the Philippines. Tests were also carried out to see what type of emergency equipment could be successfully used between Titikaveka and Avarua.

Second Camp Held During Easter

So successful was this camp that a second one was held during the Easter break. On this occasion a very ambitious programme was undertaken—the construction of a new and more permanent Club transmitter.

A transmitter was designed for normal operation as a 100-watt amateur station, but able to operate on 400 watts if required for broadcasting. At that stage the broadcasting station in Rarotonga was a 250-watt transmitter situated at Rarotonga Radio at Black Rock. The use of this communications transmitter for broadcasting was not altogether satisfactory, and the Social Development Department began discussions with the Radio Club on the setting up of a transmitter in Avarua. (The Radio Club had earlier been given permission by the Director of Social Development to operate their station from the Department's building in Avarua, where their regular classes were held.)

The result of the Easter camp and of these negotiations was that the Radio Club agreed to make the new transmitter available for broadcasting for a period of two years.

Since 1960 the new Club transmitter has filled the dual role of broadcasting station transmitter on the 60-metre and 31-metre broadcast bands, and amateur transmitter on the 80-metre, 40-metre and 20-metre amateur bands.

Five Members Pass Exam

Senior members of the Club continued to make rapid progress, and by the end of 1960 it was decided that some would be ready to sit for the examination for the Amateur Radio Operators' Certificate by March 1961, a year earlier than had been planned when the class started.

The result of the examination was that Henry Savage and Rau Maeva passed. The Club chairman, Teau Aiturau, and Kimi Ngaitemate obtained passes in theory, but failed in their morse tests. A month later they were re-examined in morse and passed. In September of the same year Nooroa Tangaroa, a late starter in the class, also passed.

These five had call-signs allotted them immediately, and they can be heard on the air on 80 metres as follows:

Henry Savage	ZK1BP
Rau Maeva	ZK1BR
Teau Aiturau	ZK1BT
Kimi Ngaitemate	ZK1BU
Nooroa Tangaroa	ZK1BW

ZK1BW and ZK1BT have been the most active. The former in particular has become widely known on 80 metres among New Zealand, Australian, Fijian and American amateurs.

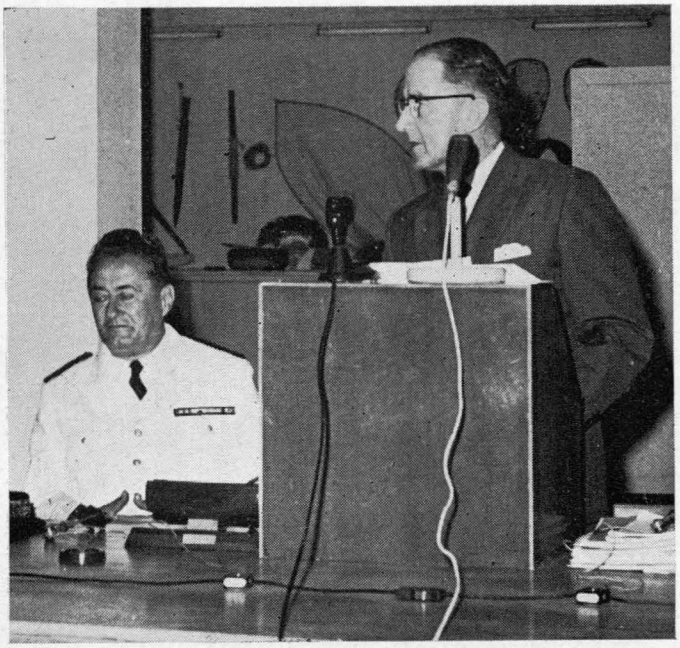
All are now studying for their permits to operate on the higher frequency

(Continued on page 40)

A public display held during a Club camp.

SPC Work Programme For '63

At its twenty-fourth session held at Noumea from October 15-25 last, the South Pacific Commission reviewed progress made in its work programme and made plans for its continuance. Main decisions taken at the session are recorded below.



The chairman of the session, Mr. C. G. R. McKay, speaking at the opening meeting. Seated is His Excellency the Governor of New Caledonia, M. Pechoux.

THE South Pacific Commission held its twenty-fourth session at its headquarters in Nouméa from October 15-25 last, and laid down its 1963 budget programme. For the first time since 1948, representatives of the Netherlands were missing. Although formally a member of the Commission until the end of the year under the terms of the Canberra Agreement of 1947, a delegation from the Netherlands did not attend as that country had ceased to administer any territory in the area from October 1, 1962.

The withdrawal of the Netherlands presented certain budgetary problems which, however, were resolved for the coming year in such a way as to cause the least reduction in the Commission's activities in the fields of health, economic and social development in the South Pacific area.

The session was presided over by the Senior Commissioner for New Zealand, Mr. C. G. R. McKay. Mr. McKay has been a Commissioner for New Zealand since the inception of the Commission in 1948, and announced his retirement from that position at the end of the session.

In determining the work programme, the Commission paid special attention to the recommendations made in all fields by the fifth South Pacific Conference of local inhabitants of the area, held at Pago Pago, American Samoa, during July, 1962. As a result of this there will be increasing emphasis on training as well as special efforts to meet particular requirements of regional significance.

New Personalities

New personalities at the session included the Hon. Afoafouvale Misimoa, M.L.A., of Western Samoa, the Hon. Teariki Tuavera, M.L.A., Cook Islands, and Mr. C. Craw, all attached to the New Zealand delegation; Mr. A. M. Wilkie, C.M.G., newly-appointed British Resident Commissioner in the New Hebrides, attached to the United Kingdom delegation; Mr. Richard Taitano, Director of the Territories Office, U.S. Department of the Interior, Mr. Edward J. Thrasher of the Department of State, and Mr. George Gray, U.S. Consul at Suva, Fiji, attached to the United States delegation; and Mr. F. Lamodière, *Délégué français de la Première Subdivision des Iles du Centre* of the New Hebrides, attached to the French delegation. The Australian party's five new members included Mr. H. M. Loveday, M.B.E., of the Department of External Affairs, Canberra, who has replaced Mr. D. W. McNicol as Second Commissioner. Other new members were Mr. R. H. Gardner, Department of External Affairs, Mr. J. Walsh, Department of Territories, and two Papua and New Guinea representatives, Mr. John Akunai and Mr. Mahuru Rarua Rarua, who attended as advisers.

Staff Changes

The Commission appointed Mr. W. D. Forsyth, O.B.E., an Assistant Secretary in the Department of External Affairs, Canberra, and first Secretary-General of the South Pacific Commission (1948-1951) to be Secretary-General again, in succession to Mr. T. R. Smith, whose five-year term of office ends in March, 1963.

The Commission, recording its appreciation of the work of Mr. Smith, referred especially to the expansion of activities that had occurred during his term of office and the co-operation that had been built up with other organizations.

Tributes were also paid to Miss Leonie Martin, first Health Education Officer of the Commission, who has joined the World Health Organization, Mr. A. E. Read, Editorial and Publications Officer since the Commission's inception, who resigned in October, and to Dr. W. Norman-Taylor, Public Health Officer, whose term ended in December.

Research Council

The Commission noted with regret the resignation of Dr. P. W. Dill-Russell, and that Dr. Delmar Ruthig was no longer working in the area. Dr. C. H. Gurd, Fiji, and Dr. A. S. Osborne of Washington, U.S.A., were appointed members of the Research Council from November 1, 1962.

The Research Council was directed to hold its thirteenth meeting immediately after the Conference on Rural Health at Papeete, Tahiti, in April. The meeting will deal with health matters only.

Health Programme

Public Health: A Conference on Rural Health will be held in Tahiti during April, 1963. In addition to rural health services as such, maternal and child health programmes in rural areas will be examined, particular attention being given to technical problems including obstetric services, weaning foods, immunizations, intestinal parasites, school health problems, etc.

It is expected that specialists of international status will attend this Conference, which will also benefit from participation of the team at present making a survey in the area through the joint initiative of WHO and the South Pacific Commission.

Health Education: Within the limit of its resources the Commission proposes to expand its health education training courses for medical assistants, nursing staff and teaching staff. It will support the production of teaching material adapted to local conditions and will assist, in the field of health education, in the WHO malaria eradication project in the British Solomon Islands Protectorate.

Technical information on specific topics will continue to be circulated and,

The session in progress

if possible, increased through the health information service. A new health education officer in succession to Miss Martin will be recruited early in 1963.

Nutrition Textbook Planned: In the field of nutrition—which has received continuing attention from the Commission ever since its inception—it was decided to consolidate the findings of nutrition research workers who have worked in the Commission area, and to produce a practical textbook designed for staff working in the public health field throughout the region.

The Commission recognized the close relationship between nutrition and general economic and social problems and, depending on the extent of territorial interest, tentatively planned a research survey for which essential specialist staff would be a statistician, nutritionist, and sociologists, working in urban areas where problems of malnutrition mainly arise, especially among casual labourers.

Training: On the training side, interregional refresher courses were contemplated with the idea of directing the activities of auxiliary staff of local health services to preventive medicine and public health. There will be co-operation between the Commission's health section and WHO in a nursing education seminar expected to be held in Fiji during 1963.

Assistance To Research: Financial assistance for research projects in the health field has long been a feature of the work of the Commission. The Commission asked that projects for applied research of definite value for the improvement of the health conditions of the South Pacific populations be submitted at its next session. A study of the causes of cardio-vascular diseases has been suggested.

In the meantime the Commission will continue to assist specific projects already under way, including the toxicity of fish and eosinophilic meningitis. In these last two subjects, there will be co-operation with the University of Hawaii, the *Institut Français d'Océanie, Institut Pasteur,* and medical authorities in New Caledonia.

Economic Development

Plant And Animal Projects: Expanded activities were foreshadowed in the fields of plant and animal production improvement, plant and animal protection and economic affairs generally. Inter-territorial study visits will be assisted, grants will be made to experimental stations and research institutions, advisory services will be broadened through a programme that will include the publication of technical directories and other material, and a tropical agriculturist is to be recruited. Animal husbandry, which hitherto has not figured largely in the Commission's programme, is to receive special attention in 1963 with a view to helping the improvement or development of forms of animal husbandry adapted to conditions in the area.

In consultation with territorial administrations and with the co-operation of international organizations, plant and animal protection will be covered thoroughly in all matters relating to the control of pests (including rats) and diseases of plants and domestic animals, and the prevention of the damage they cause. Special advisers will be sought to augment the work of the Commission's own staff on these problems.

Research work will continue on *Oryctes* and related insects, and negotiations will continue with the United Nations Organization for assistance on a large scale and long-term project aimed at controlling this pest.

Fisheries And Boatbuilding: Work in fisheries in 1963 will continue along present lines, with emphasis on development of the advisory and technical information service on subsistence fishing and fishing for local markets, fishing in inland waters and fish breeding, and the utilization of pearl shell, in that order. A handbook on Pacific fisheries will also be prepared.

Two more courses in boatbuilding will begin in 1963; one at Nouméa, the other a further course at Auki, in the Solomons. The latter will follow the highly-successful two-year course which ended there last September, during which twenty-four Pacific islanders from six territories built seven 26′ boats. For each of next year's courses the United Nations and the administrations concerned will provide funds and facilities respectively.

Economic Affairs: Among the activities in this field the Commission will provide economic information of regional interest and an advisory service with emphasis on the adaptation of customary land tenures, economics of smallholder farming, credit and banking facilities adapted to area conditions, marketing and commercial and economic education. In addition to specialized training centres such as boatbuilding, attention will be given to the possibility of wider technical training of local staff and leaders in agricultural extension, possibly with United Nations financial assistance, and training in the field of business and elementary economics.

Social Development

Literature Promotion: The Commission's Literature Bureau operating from Sydney will continue, and a review of its functions will be made during the year. This will include consultation with territories and consideration of merging the Bureau's functions into a wider project in community education generally.

The Commission reviewed the work of the Literature Production Training Centre which has operated in Honiara in the British Solomon Islands since early 1960, and which will wind up its work at the end of 1962. In all, thirty-six trainees from ten territories attended the Centre, which is considered to have been one of the most successful promoted by the Commission, which acknowledged with appreciation the assistance provided by Unesco and the Government of the British Solomon Islands Protectorate.

Commissioners, advisers and principal officers of the Secretariat who attended the twenty-fourth session. Left to right, front row: Mr. Dudley McCarthy, Australia; Hon. Knowles A. Ryerson, U.S.A.; Mr. T. R. Smith (Secretary-General); Mr. C. G. R. McKay, N.Z.; Mr. H. Nettre, France; Sir Kenneth Maddocks, U.K. Middle row: Mr. K. R. Douglas Scott, Australia; Mr. T. R. Cowell, U.K.; Sir David Trench, U.K.; Mr. John Akunai, Australia; Hon. Carlton Skinner, U.S.A.; Mr. B. Hebert, France; Mr. H. M. Loveday, Australia; Mr. Mahuru Rarua Rarua, Australia; Hon. Teariki Tuavera, N.Z.; Mr. Richard F. Taitano, U.S.A. Back row: Dr. Jacques Barrau (Executive Officer for Economic Development); Dr. Richard Seddon (Executive Officer for Social Development); Mr. Edward J. Thrasher, U.S.A.; Mr. J. D. Walsh, Australia; Mr. A. M. Wilkie, U.K.; Mrs. Frances McReynolds Smith, U.S.A.; Dr. Guy Loison (Executive Officer for Health); Mr. J. M. McEwen, N.Z.; Mr. Charles Craw, N.Z.; Hon. Afoafouvale Misimoa, N.Z.; Mr. R. H. Gardner, Australia.

Possibilities of follow-up training after closure of this Centre are to be investigated.

Library Development: As a result of an approach made by the Commission, Unesco made available the services of a library specialist to examine possibilities of future development of territorial library services. The Commission decided that the report of the specialist should be circulated to territories with the object of following up its recommendations, including the possibilities for training of local personnel. The Commission will continue to support the development of library services as far as its means permit.

Education: In this field the Commission has met specific territorial requests for assistance in various ways and helped through the conduct of seminars and workshops in selected fields. A regional education seminar was projected for 1964 during which year it is also hoped to establish an education research centre for the study and development of new techniques and media in both formal and community education. It was also hoped to convene a seminar on language teaching for two months during 1963.

Community Education: Main activity during the year in the field of co-operatives was the holding in Fiji, under joint FAO-SPC auspices, of an eight-week regional training centre for twenty-three co-operatives officers from six South Pacific territories. The Commission recorded its appreciation of the support given by the Food and Agriculture Organization of the United Nations and the Government of Fiji. Continuation of the co-operatives project in 1963 was approved.

During the year, territories will be consulted concerning their probable future needs for specialist assistance with training.

Women's interests and home economics will be given special attention, and a home economist recruited by the Commission will commence work in the area early in 1963. In addition to training courses and other assistance given in promoting women's groups and other forms of community activity, it is hoped to help develop distribution facilities for literature and produce a pilot edition of a magazine of community interest.

Homecraft Training Centre: The Commission approved plans to collaborate with FAO and the Government of Fiji to establish a homecraft training centre as a first step in the development of a community education training centre for the region. A residential course will begin in 1963 for the training of women's interests area organizers and homecraft field personnel.

Applied Research: The urbanization information centre which has just been established at Commission headquarters will come into full operation during 1963, and in 1964 a technical meeting will be held on the subject of "Areas of Responsibility in Central and Local Government in Pacific Urban Areas." Wide representation of territories is expected at this meeting.

A survey is to be made of present and potential handicrafts within the region to assess possible activities for a handicrafts centre.

Meetings And Study Groups: The development of small-scale private enterprise will be the topic for a study group at Honiara, British Solomon Islands, early in 1963. It is hoped that the participants will also be able to visit Papua and New Guinea to see for themselves developments there in this field. A second study group of a similar kind is expected to be held later in the year.

A regional conference on low-cost housing in the South Pacific will concentrate on design, materials and standards, finance, including self-help aspects, land for houses and the planning of services. Following the very useful and successful conference held early this year in Tahiti on the importance of labour problems in the social and economic fields, the possibility of a regional technical conference in 1964 concerned with labour problems at the highest level is to be investigated with territorial administrations.

South Pacific Games: The Commission undertook to assist the South Pacific Games Council in meeting its day-to-day organizational expenses, and to make a cash grant to the Council towards the purchase of technical equipment necessary for the effective staging of the Games.

Two of the new "T" Class launches anchored off Auki.

AUKI TRAINEES BUILD FOUR TOURING LAUNCHES

In 1961, the Marine Department of the British Solomon Islands Protectorate placed an order with the SPC Boatbuilding School in Auki for the construction of four 25' "T" Class touring launches.

The plans appear on the opposite page. The basic hull design for these launches was the one used for the 25' cutters built in 1961 and operated for a while at the SPC-FAO Fisheries Training Centre at Tulagi. The internal layout and deck arrangements have, however, been modified considerably.

The new launches have two berths, a small galley and sanitary installations in a comfortable cabin forward. In addition, the roomy cockpit is fully sheltered and has been turned into an after cabin.

Two of these launches have been completed. Work on the two others had to be suspended pending arrival of the engines. They will be completed during the next Boatbuilding Course to commence at Auki in March, 1963.

Fiji Prepares For Pacific Games

(Continued from page 23)

British Solomon Islands, Niue, New Caledonia, Western Samoa and American Samoa.

French Polynesia will play a prominent part, if Tahiti's enthusiasm is any criterion. It is anticipated that about forty-eight entrants will be coming from this territory to compete in most of the twenty-one men's and ten women's athletic events as well as in the men's basketball, lawn tennis and Association football.

It is expected that the British Solomon Islands will provide entries in the men's athletic and swimming events, and will also enter a team for the Association football contest.

Members of the Guadalcanal Local Government Council have agreed to include £A100 in their 1963 estimates as a contribution to the fund to send Solomon Islands athletes to the Games. It is anticipated that other local councils in the Solomons will also contribute.

Accommodation Arrangements

Athletes from the island territories will pay for their own accommodation in Fiji, which will be provided in dormitories at the Nasinu Teachers' Training College and at the Grammar School Hostel. The charge will be about 20/- to 25/- per day. This will include three good meals of Polynesian-type food each day and a light supper. Transport will be included in the charge.

Mr. L. O. Simpson, for long a leading figure in the amateur athletic sphere in Fiji and one of the prime movers in the founding and organizing of the Games, is Secretary of the South Pacific Games Council and also Secretary of the Organizing Committee in Fiji. Though now in New Zealand, Mr. Simpson is continuing to act energetically in both his secretarial capacities. He is coming to Fiji for the Games at his own expense a few weeks before they are due to begin, and his help in that period will be of great value.

Valuable, too, are the services of Mr. W. P. Ragg, who has had experience of both Olympic and Empire Games, and whose knowledge has proved of great help[1].

Both Mr. Ragg and Mr. Common attended the Commonwealth Games held recently in Perth, the former as manager of the Fiji team, the latter as official representative from Fiji. Earlier in the year Mr. Common had been appointed an international referee and judge by the International Amateur Boxing Association, and at the Games he combined with his administrative duties, the refereeing of boxing contests, at the invitation of the Australian Amateur Boxing Association.

As Mr. Common was on the staff of the Director of Organization of the Games, he had an excellent opportunity to study closely the organization of the Games in all aspects, including the preliminary arrangements, accommodation, layout of the arena, equipment, and the reception and transport of visiting teams. His experience will be of great help to the Organizing Committee of the South Pacific Games.

[1] Mr. Ragg was Acting Chairman of the Organizing Committee until Fiji's Director of Public Works, Mr. J. H. Common, returned from leave recently and resumed the Chairmanship.

Special Issue Of Stamps

Four special stamps—3d., 9d., 1/- and 2/6d.—will be issued to commemorate the first South Pacific Games.

The threepenny stamp, which is the inland letter postage rate in Fiji, will feature the official symbol of the Games. For the ninepenny stamp, which is the airmail postage rate for letters to New Zealand, the central motif will be a discus thrower. For the one shilling stamp—the airmail letter postage rate to Australia—the design will portray two hockey players in action. For the 2/6d. stamp—the airmail letter to Britain—a female high jumper clearing the bar will be featured.

Each stamp will incorporate the Southern Cross constellation, a small palm tree and the sea, to convey the impression of the Pacific Islands background of the Games. The Royal Portrait will also appear on each stamp.

It is the intention of the Post Office to release them for sale on August 1, 1963.

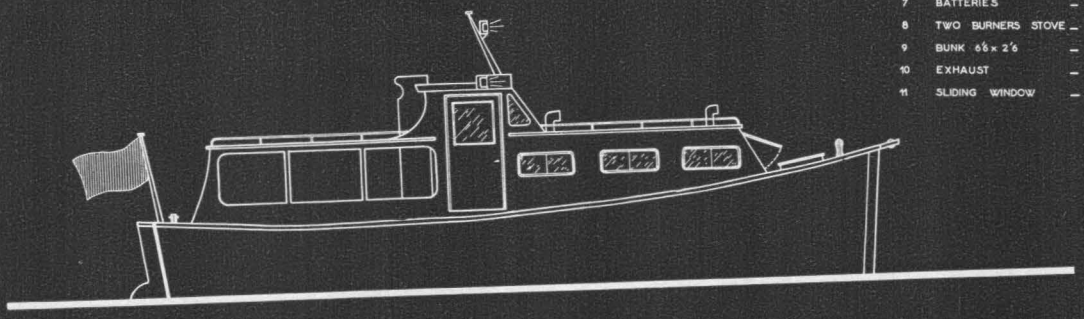
SPC Economist Completes FAO Assignment In Western Samoa

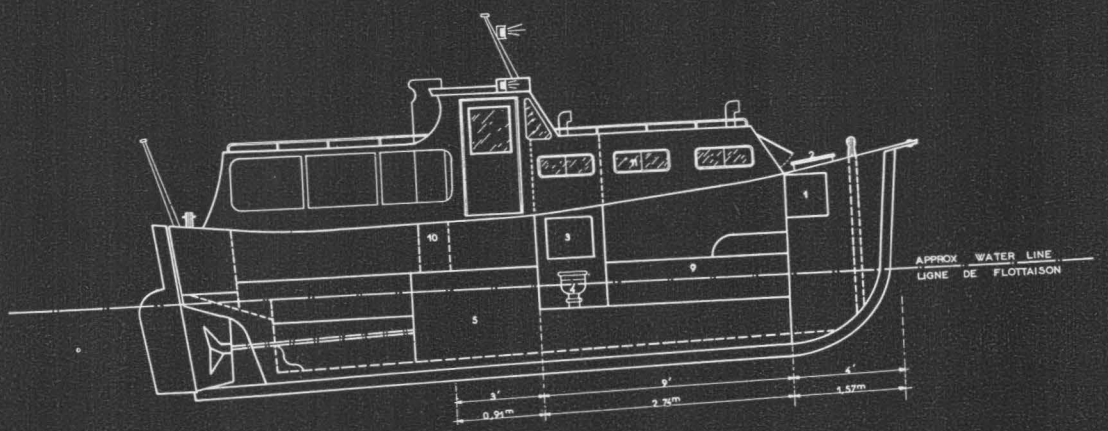
Mr. V. D. Stace, the Commission's economist, recently completed a three-month assignment as agricultural economist with a technical assistance mission sent by the Food and Agriculture Organization of the United Nations to Western Samoa. On completing his field work Mr. Stace left Apia for Kuala Lumpur in Malaya, where he presented his report to the United Nations regional representative there. He returned to Commission headquarters on December 13.

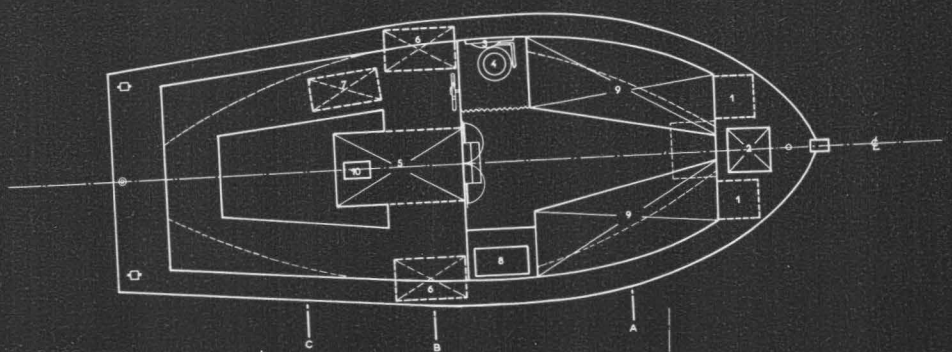
— 25 ft "T" CLASS TOURING LAUNCH —

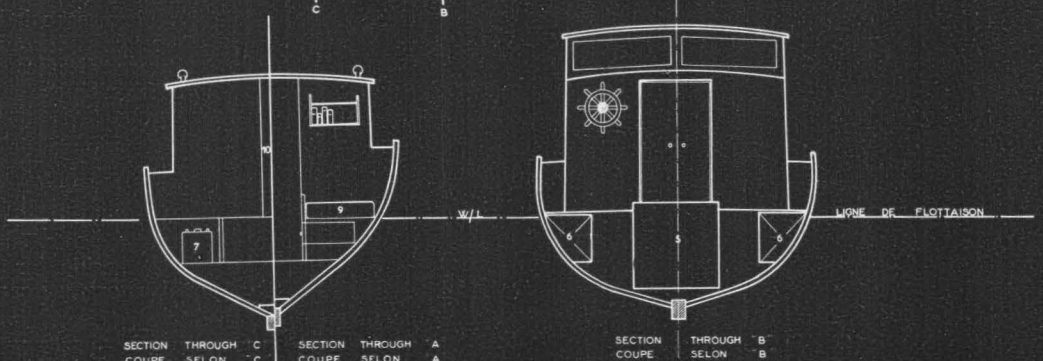
— VEDETTE DE TOURNEE CLASSE "T" 7m62 —

1	FRESH WATER	—	EAU DOUCE
2	HATCH	—	ECOUTILLE
3	FOLDING WASH BASIN	—	LAVABO RABATTABLE
4	TOILET SEAT	—	W.C
5	ENGINE	—	MOTEUR
6	FUEL	—	COMBUSTIBLE
7	BATTERIES	—	BATTERIES
8	TWO BURNERS STOVE	—	FOURNEAU A DEUX BECS
9	BUNK 6'6 x 2'6	—	COUCHETTE 2.00m x 0.85m
10	EXHAUST	—	ECHAPPEMENT
11	SLIDING WINDOW	—	LUCARNE A GLISSIERE









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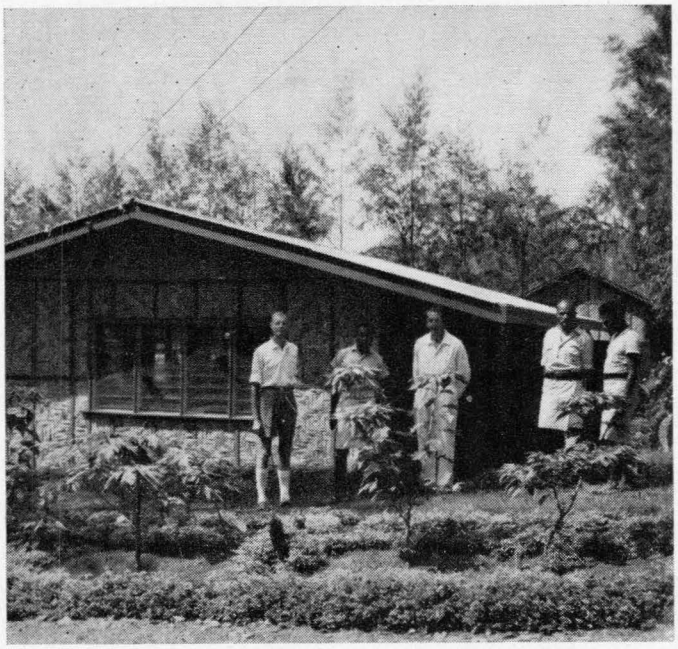
SECTION THROUGH "A" / COUPE SELON "A"

SECTION THROUGH "B" / COUPE SELON "B"

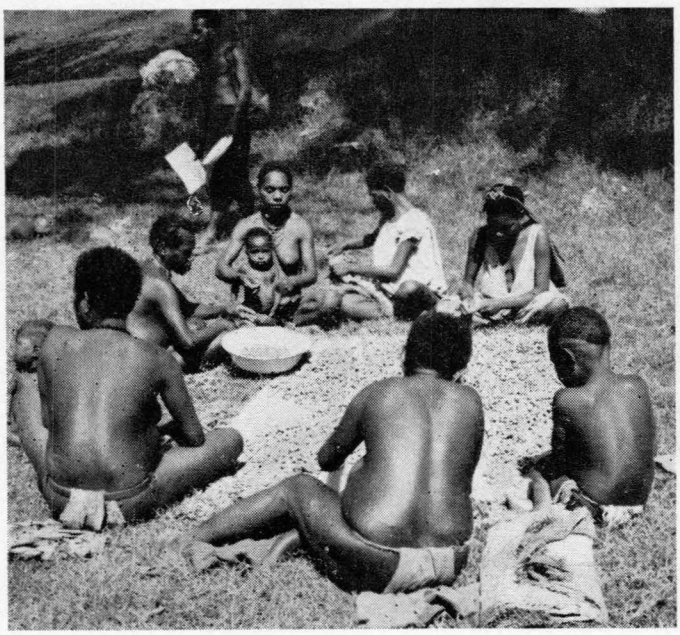


Children suffering from protein deficiency are housed in this building. Author on left. Right: The nursing staff teaches mothers how to prepare palatable dishes based on peanuts.

Team Studies Infant Nutrition In New Guinea Highlands

A lack of protein rather than food is the main nutritional problem in New Guinea. At Kundiawa Hospital, in the Highlands, a nutrition research unit has been set up to study the widespread malnutrition that exists in the region among infants and toddlers, and to develop a suitable locally-produced protein-rich food to make up the deficiency.

By K. V. BAILEY*



Mothers shelling peanuts.

IN 1956 Dr. H. A. P. C. Oomen and Miss S. Malcolm, of the South Pacific Commission, carried out nutrition surveys in New Guinea, including the Chimbu area near Goroka (Eastern Highlands District). Further studies were made in the Chimbu by Dr. Venkatachalam, of the Nutrition Research Laboratories, Hyderabad, India.

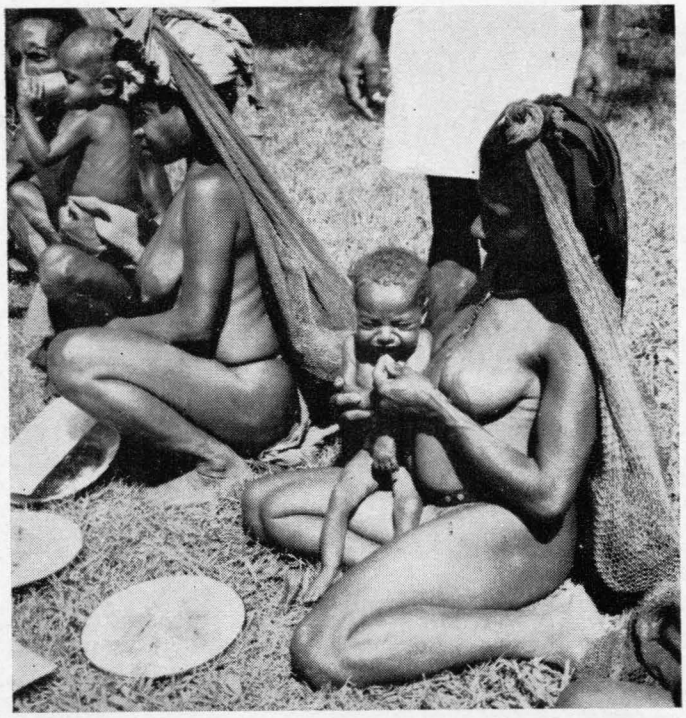
In order to follow up these studies the Government of Papua and New Guinea has established a Nutrition Research Unit at Kundiawa, the administrative centre of the Chimbu sub-district.

Lack Of Protein The Main Problem

The main nutritional problem in New Guinea is not so much a lack of food as a lack of protein. This results in retarded growth, especially of infants aged six months to two years. In some areas, malnutrition occurs as a major public health problem, especially among infants and toddlers in the Highlands. The two most common diseases due to malnutrition which we see in children are marasmus and kwashiorkor.

A fully-equipped laboratory in the Kundiawa Hospital has been set up to assist clinical nutrition research on malnourished children. One of the three pediatric wards of Kundiawa Hospital has been set aside for these cases. An additional laboratory can undertake food analyses.

* Dr. Bailey, of the Department of Public Health in the territory of Papua and New Guinea, is in charge of the project.



Lunch on the lawn at Kundiawa Hospital.

Children quickly learn to like the new food.

The whole project has cost about £80,000. The staff includes a medical nutritionist, medical technologist, nutritionist, and infant welfare sisters. A food biochemist is still required.

Sweet Potato The Staple Food

The staple food in the Highlands of New Guinea is the sweet potato (*Ipomoea batatas*). About 90% of the energy requirement—even for toddlers—and half of their protein has to come from this. They also eat leafy vegetables, but animal meat is rarely eaten except at an occasional pig festival.

The primary aim is to find a suitable locally-produced protein-rich food for supplementing the diets of infants and toddlers during and after weaning. Nursing mothers also are in need of such a supplement. Lactation is normally prolonged for three to four years, but it is only sufficient in quantity for the first six months of the baby's life.

Peanuts A Valuable Protein Source

Work has been started on peanuts, because they not only grow well in the Highlands but are already popular as food for older children and adults. Later investigations have been made on soya beans, other indigenous beans and the numerous local varieties of sweet potato, which have been found to differ markedly in their protein content.

When suitably prepared, peanuts have been found to be very effective for the treatment of marasmus and kwashiorkor. It is, however, important to make sure that they are properly minced to the consistency of butter.

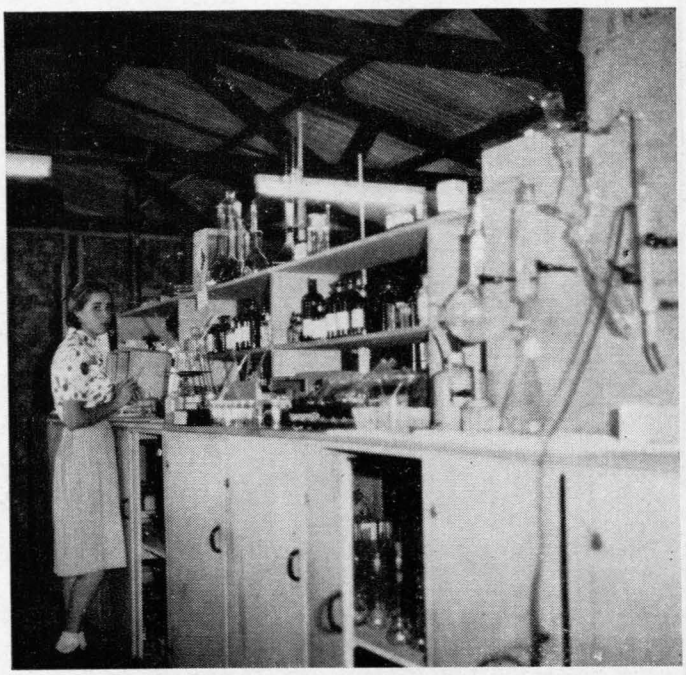
PEANUT BUTTER is prepared as follows:

1. (a) If an oven is used, mature sun-dried peanuts are baked lightly in a warm oven, and thoroughly dried out by leaving over-night in the oven (after the fire has gone out); or—

(b) using an open fire, bake and dry out peanuts thoroughly by gently heating over smouldering fire for two to four hours. Light baking improves the flavour and makes them more digestible; do not burn or make too brown.

2. The cooked nuts are then put through a corn grinder[1]. Mince twice if necessary. No salt or preservative necessary, but a pinch of salt may be added if desired.

[1] The model used is called "Beatriz Corn Grinder", made by John Harper & Co., Albion Works, Willenhall, Staffs., England. Retail price in Goroka is £2 stg.



Part of the biochemistry laboratory set up for the project.

PEANUT BUTTER WITH MASHED BANANA (equal parts of each): This is suitable for infants, especially under six months. It should be diluted with water for infants under three months.

PEANUT BUTTER WITH SWEET POTATO AND PUMPKIN (equal parts of each): The peanut butter is mixed with mashed boiled sweet potato and mashed pumpkin. This is suitable for toddlers and infants over about four months. The boiled peanut mixture must be used the same day. Locally available greens may be added.

PEANUT BUTTER BALLS: Baked peanut butter lasts for months. Many children prefer to eat it plain, rolled into an egg-sized ball which can be held in the hand just as the sweet potato is held at home —this is essential to the child's psychology. Several 'peanut balls' can be eaten daily. Alternatively, peanut butter can be put inside a banana or baked sweet potato, split lengthwise.

Peanut Foods Popular With Children

Peanut foods prepared in this way do not cause diarrhoea. Success is partly attributable to the fact that the children like them so much—and can take large quantities of protein in small bulk of food. This is a help with severely malnourished children whose appetites are poor. Peanut foods are often acceptable when milk is refused. It has been found that children given peanut foods without milk gained weight just as fast as others given peanuts and skimmed milk.

Since peanut foods can cure most cases of malnutrition, it follows that malnutrition could largely be prevented by using them as regular infant foods in villages. A small plot of peanuts will supply the infant's needs.

Pilot projects are under way, with peanut grinders located at strategic points, to convince the village people of the value of this feeding and to assess the cultural, agricultural, economic or other factors to be taken into consideration in the implementation of this food habit at the village level. Health education is very much needed in this connexion.

Further Studies In Progress

Further studies are in progress to determine the digestibility, biological value and protein quality of peanuts and other foods. Also being studied is the effect on children's growth over a twelve-month period when their diets are supplemented with (a) peanut, (b) soya-bean, or (c) skimmed milk. The supplement supplies ten grams of extra protein per day.

One condition common among Chimbu women is nutritional oedema, a kind of dropsy due to malnutrition. The incidence of this and other nutritional disturbances in relation to the ordinary daily diet of these people is also being studied.

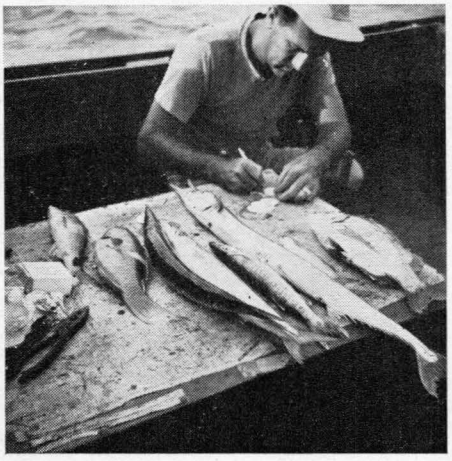
We consider it very important, too, to work closely with the Department of Agriculture, Stock, and Fisheries, so that jointly we may encourage people to produce, and to eat, protein-rich foods such as fish, eggs, meat and milk. Mention has been made of improved varieties of sweet potato, which are relatively richer in protein.

The ultimate aim is to make the territory self-supporting in its food production, including sufficient protein-rich foods for the urban as well as rural populations, and so avoid undue dependence on imported foods. In this way the research programme is geared to the practical nutritional needs of the people, concentrating on those who most need our help, namely, infants and toddlers.

Fish Poisoning Study Makes Progress

ACCORDING to doctors in New Caledonia, cases of fish poisoning are an almost daily occurrence in medical practice there. Unfortunately, as one doctor remarked, patients rarely know the proper name of the fish they have eaten or where it was caught. Certain fish have a bad reputation, but how much this is really justified is not scientifically known. It appears that large numbers of perfectly good fish are thrown back and never brought to the market because no-one will buy them, while others thought to be harmless may occasionally give trouble.

This difficulty is found in many Pacific territories, and the University of Hawaii, with the assistance of the South Pacific Commission, has been undertaking in-



Dr. Helfrich recording details of fish caught during his recent visit to New Caledonia.

vestigations designed to throw light on this and related problems.[1]

Dr. Philip Helfrich, of the Marine Research Laboratory at Honolulu, has recently paid a visit to Fiji and New Caledonia in an attempt to pinpoint the areas where toxic fish are found, and to obtain regular sources of supply for laboratory testing. Because of the assistance willingly given by the Nouméa Fisheries Co-operatives, he was able to carry out useful on-the-spot investigations and has set up a fish-testing pilot project in conjunction with the French Institute of Oceania at Nouméa.

In Fiji, the Veterinary Service was able to assist him, particularly in his studies of toxic sardines, which are of serious concern there.

[1] See *South Pacific Bulletin*, October, 1961, "Fish Poisoning In The Tropical Pacific", by A. H. Banner.

SPC Co-operatives Specialist Attends Seminar At Saipan

By invitation of the High Commissioner of the United States Trust Territory of the Pacific Islands, Mr. R. H. Boyan, SPC co-operatives specialist, was a senior director and the principal instructor at the second co-operatives seminar organized in the territory. It was held at Saipan from October 8-22.

On November 25 he went to American Samoa at the invitation of the Governor to assist in the setting up of the first co-operatives in that territory. He conducted a seminar and assisted in training office-bearers for the pilot societies.

Cook Islanders Calling . . .

(Continued from page 32)

bands. Two of them—ZK1BT and ZK1BW—have accepted full responsibility for conducting a junior class of about fifteen members. In order to make fast progress this keen class attends lectures on three nights a week.

The January Camp has become a permanent Club feature, and last year was the largest to date. It was held at the Arorangi School, and lasted for twelve days.

Displays Maintain Public Interest

Public displays are given occasionally. These serve to keep the public informed about amateur radio, and to give members an opportunity to interest others in their hobby.

In 1960 some members of the Club formed a co-operative society for the purpose of manufacturing and repairing radio equipment. At that time suitable transistor radios for Cook Island listeners were not available, and one was designed which the Society started to manufacture. But after some dozen sets had been completed, the position changed, when cheaper and more suitable imported receivers became available.

The Society is now working steadily on servicing work and the manufacture of special items of equipment. At present it has no permanent staff, work being done on a voluntary basis by members.

The beauty and quiet charm of the Windward Islands are evident in this picture of a secluded Tahitian valley.

French Polynesia

The territory of French Polynesia comprises more than one hundred and thirty islands in five groups scattered over a million and a half square miles of Pacific Ocean. The steadily-growing population is approaching 100,000. Today, the new and rapidly-expanding tourist industry is providing a welcome stimulus to the territory's economy.

LOCATED in the Pacific Ocean between 7° and 27° latitude south and 134° and 155° longitude west, French Polynesia, an Oversea Territory of the French Republic, comprises five groups —the Society Islands, the Marquesas, the Tuamotu Islands, the Gambier Group and the Austral Islands—with a total land area of 1,544 square miles.

In all, there are 130 islands scattered over 1,544,400 square miles of ocean. In the centre lies Tahiti, 11,184 miles from France, 4,349 miles from the American coast, and 3,728 miles from Australia.

Geographical Outline

The Tuamotu Islands are coral atolls. The other groups are mainly mountainous islands of volcanic origin. Extremely rugged, they are dissected by deep gorges and rivers that often become torrents. Each high island is usually protected by a coral reef which, when not close inshore, encloses a lagoon.

The Society Group comprises the Leeward and Windward Islands. Tahiti is the largest, highest and most populated of the five Windward Islands—in fact, of the whole territory. It covers an area of 386 square miles, and has two mountain peaks—Mt. Orohena (7,338′) and Mt. Aoraï (6,784′). A channel five miles wide separates it from Moorea (51 square miles).

Raïatea (93 square miles), with its capital Uturoa, lies 120 miles west of Tahiti. Raïatea was formerly the religious centre of pagan Polynesia. It is the largest of the Leeward Islands, which also include Bora Bora (14.5 square miles) with the safest and one of the most beautiful harbours in the Group.

The Marquesas, approximately 932 miles north-east of Tahiti, comprise nine islands. The largest of these—and the most populated—is Hita-Oa, with 93 square miles and 1,000 inhabitants. Above it towers Mt. Keavi (4,265′). The painter, Paul Gauguin, is buried on this island.

The Tuamotu Archipelago (305 square miles) is composed of approximately 80 atolls. The largest, Rangiroa (43 miles long), is the nearest to Tahiti, but is still 186 miles distant. The Gambier Group (11.5 square miles) extends 1,055 miles south of Tahiti.

The Austral Islands—the southernmost group of the territory—comprise five islands ranging over an area of 310 miles from north to south. Tubuaï (18 square miles) is 528 miles south of Tahiti, and Rapa (8.5 square miles), 870 miles south.

Finally, Clipperton Atoll, some 745 miles west of the Mexican coast, is not territorially part of French Polynesia but comes under the jurisdiction of the French representative in that territory. It is not inhabited.

* * *

With some differences due to latitude, the islands of French Polynesia enjoy an equable maritime tropical climate which, while relatively hot and humid, is always

In French Polynesia, over half the population is under twenty years of age.

Customers at the Papeete market buying taro (left) and fish.

Below: This fine building houses the Social Security service in Papeete.

alleviated by a breeze. This "twelve months' summer" is, to the tourist, one of the greatest charms of the islands.

Flora And Fauna

Except on the atolls, where only coconut palms grow, the islands are covered by a lush vegetation of tree ferns, bougainvillea, flame-trees, frangipani and tiare, banana palms, and orange, tangerine, and other tropical fruit trees. Tahiti is the land of flowers.

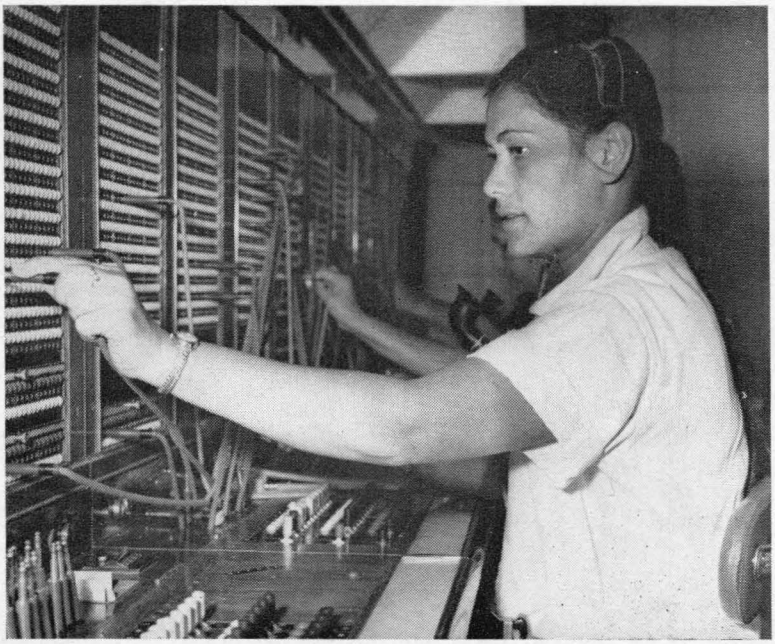
Originally the fauna of the islands was very poor, but the Polynesians introduced pigs, dogs and chickens, while the Europeans brought horses, goats and cattle. There is a great variety of bird life — sparrows, passerines, migratory cuckoos, blue parakeets, parrot-pigeons, sandpipers, "titis", migratory curlews, petrels, duck, sparrow-hawks, blackbirds and mynahs.

The marine fauna is both rich and varied. The lagoons are full of moray eels, trigger-fish, hog-fish, puffer-fish, turtles, crustaceans such as crayfish, crabs, shrimps, as well as pearlshell and edible oysters. Giant rays, bonito, tuna, trevally and shark swarm in the deeper waters. The rivers abound with eels and perch, while all kinds of coral are found in the lagoons.

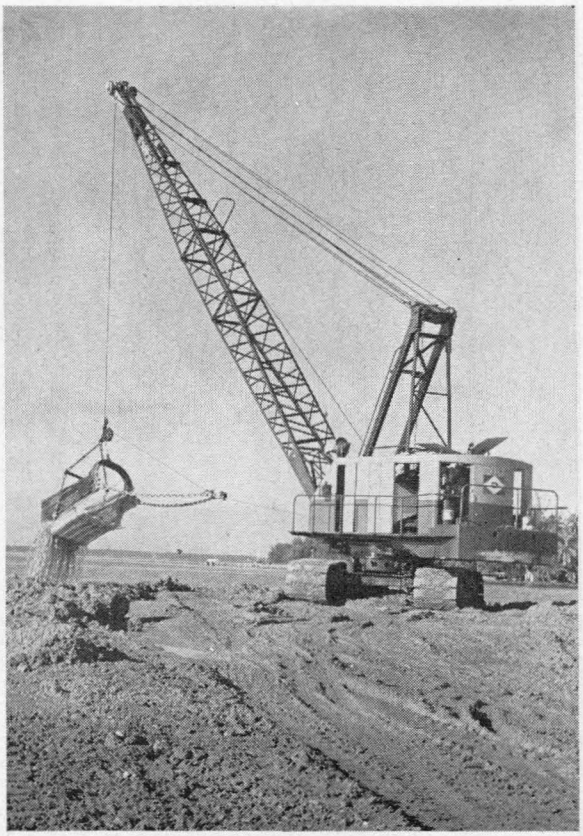
Historical Outline

The era of exploration in the Polynesian islands covers a period of over two centuries. The Marquesas were the first discovered by the Spanish admiral Mendana in 1595. Another Spaniard, Quiros, cruised for the first time in the Tuamotu Group in 1605. Tahiti was discovered in 1767 by the Englishman Wallis. A Frenchman, Bougainville, stopped there the following year. Cook visited Tahiti three times during the period 1769 to 1777, and also discovered the Leeward Islands, two of the Austral Islands, and explored the Marquesas. In 1791, the Frenchman Etienne raised the French flag in several of the Marquesas Islands in the name of the King of France. From then on, European ships called regularly.

It was during this period that a Tahitian Prince, known later as Pomare I, established his supremacy over Tahiti and the adjoining islands. In 1796, he gave his protection to a few English missionaries. His son, Pomare II, was baptized in 1812, and three years later the Tahitians became Christians. This pattern of development was shortly afterwards followed by the people of



The telephone switchboard at the Papeete post office is operated mainly by Tahitians.



Right: A dredger at work on the industrial area of Fare-Ute.

the Leeward Islands, the Tuamotu Group, and the Austral Islands, which had come under the authority of the King of Tahiti. Later on, French Roman Catholic missionaries settled in Polynesia—first in Tahiti in 1831, then in the Gambier Islands in 1834.

In 1838 Queen Pomare IV signed a treaty authorizing the French to settle in Tahiti and its Dependencies. On September 9, 1842, the Queen asked for the protection of France, and at about the same time Admiral Dupetit-Thouars signed treaties with the Marquesan Kings, ensuring French sovereignty. At the request of the inhabitants, the Gambier Islands became a French Protectorate in 1844. On November 17, 1858, France took possession of Clipperton Island.

Pomare IV died in 1877, and her son Pomare V had no heir. By a treaty signed in 1880 he entrusted his kingdom to France, which guaranteed to safeguard Tahitian laws and customs. Tahiti and Dependencies then become a French Colony, and all the inhabitants, French nationals.

Polynesia became an Oversea Territory of the French Republic in 1946, and chose to keep that status at the time of the 1958 referendum.

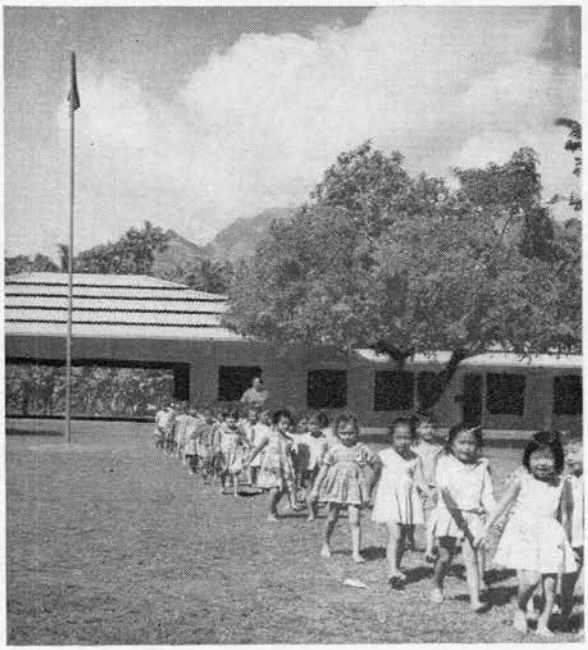
Population

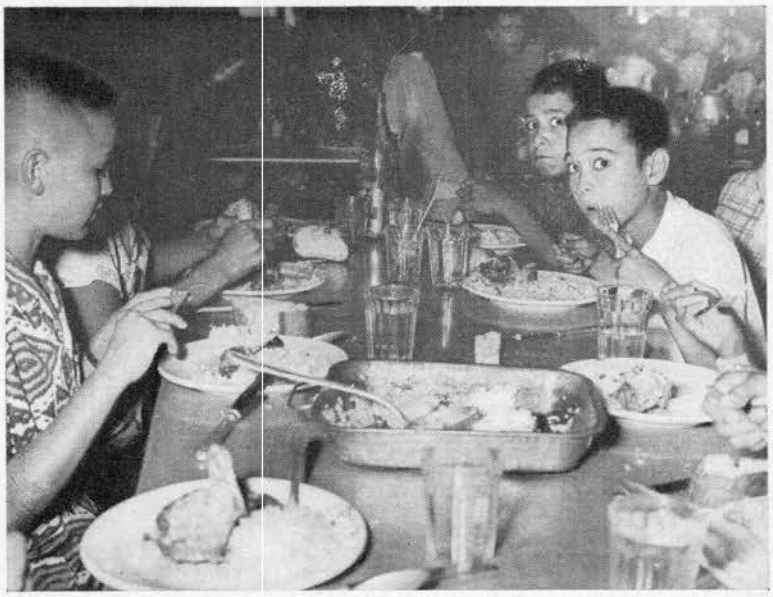
A census taken in 1956 revealed that the population of French Polynesia then exceeded 76,000. More than half of the inhabitants live in Tahiti, some 20,000 living in Papeete, capital of the territory. According to a recent survey, the population distribution is as follows:

Windward Islands (includ- Tahiti and Papeete)	45,000
Leeward Islands	16,500
Marquesas Islands	5,000
Tuamotu - Gambier Islands	9,000
Austral Islands	4,100
	79,600

The average age is low, over half of the inhabitants being under 20. The population is rapidly increasing. Between 1945 and 1955 the birth rate went from 40 to 45 per 1,000, while the death rate dropped from 18 to 12 per 1,000. If these trends continue, the population of the territory will reach 160,000 in

A typical Tahitian family. Makatea.





Dining room at the Lycee Paul Gauguin College. Papeete. Left: The end of another day for the children attending Mamao School.

1980. Even now, the average population density is 52 people per square mile, while in Tahiti it is nearing 120 per square mile.

The indigenous people comprise 87% of the total population. These people belong to the Maori race, which is said to be one of the most ancient in the world. They are probably of proto-indonesian origin, and might have reached Polynesia via the Philippines and Micronesia. They were excellent navigators, and with considerable audacity explored the Pacific in their outrigger canoes, settling in many islands. The Asiatic population—9% of the total—is mostly of Chinese origin.

Administration

As in all other Oversea Territories of the French Republic, the inhabitants of Polynesia are French citizens, and have the right to vote. They elect a senator and a deputy to represent them in the metropolitan Parliament.

The political system of the territory includes a Territorial Assembly and a Council of Government. The Assembly comprises thirty members elected by universal suffrage. It is responsible for internal affairs, and votes on the budget. The Council of Government comprises five members elected by the Assembly. Under the chairmanship of the Governor, who is head of the territory, the Council manages territorial affairs.

Polynesia is divided into five administrative areas, which are further subdivided into districts managed by indigenous officers, assisted by elected councils. The townships of Papeete and Uturoa have full electoral powers.

Education

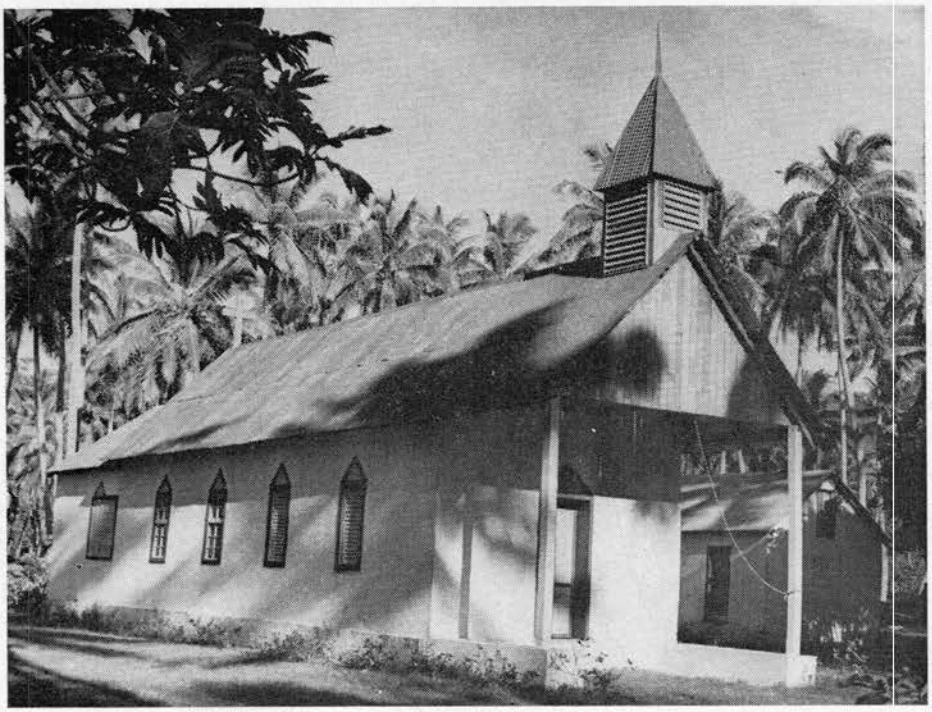
On January 1, 1962, approximately 19,000 pupils were attending school in 134 primary schools (122 State and 12 private), where for eight years they prepare for the primary school-leaving certificate. The secondary schooling includes a first cycle, which is given in four State and five private schools. The State Lycée, Paul Gauguin College, and two private establishments also provide a secondary cycle, which takes pupils up to the school leaving certificate.

The total number of pupils at January 1, 1962, was approximately 2,200. Additionally, 300 trainees are being taught in four technical establishments (industrial, commercial, agricultural, home economics), these being either State-sponsored or private.

With State assistance, an hotel catering school will be opened shortly.

Public Health

Approximately 20% of the budget of the territory, and a large part of the metropolitan grants-in-aid, are devoted to medical facilities, which at present include a general hospital in Papeete, and



The Catholic Church at Rurutu, in the Austral Islands.

The dispensary at Mamao—Dr. de Balmann-Tourneux carrying out a medical examination.

four hospitals and twenty-one clinics in the islands.

Mobile medical teams visit the outlying islands, while the *Institut de Recherches Médicales* at Papeete carries out mass campaigns for the control of endemic diseases.

Agriculture

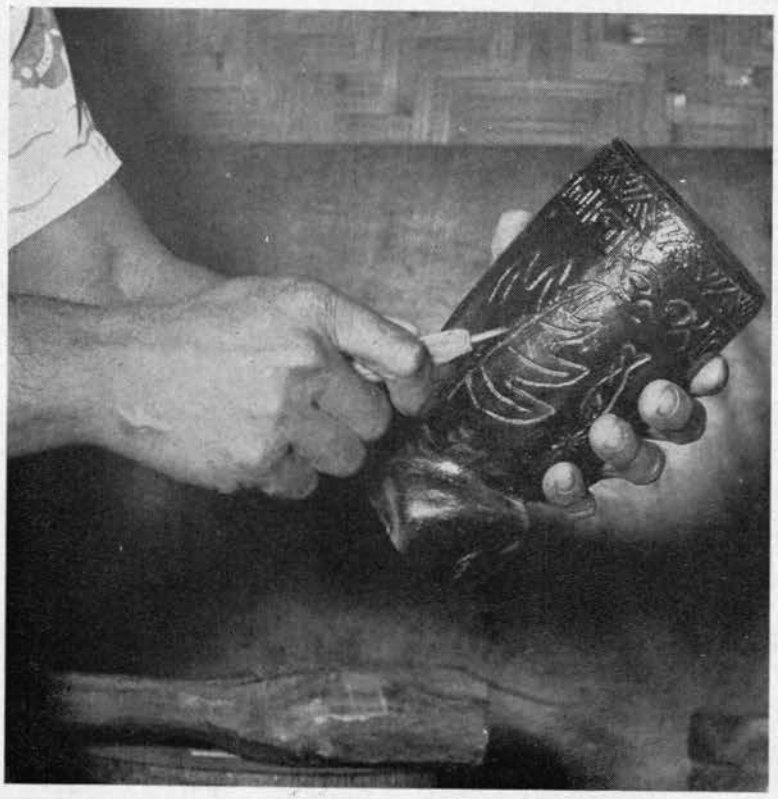
Land suitable for agriculture is found along the coastal plains. It belongs for the most part to the indigenous population, according to a system of land tenure, which provides that approximately 70% is owned collectively. For several reasons it is extremely difficult, if not impossible, to mechanize cultivation: the islands are very scattered, there is little tillable land, and the soil is unsuitable. All tropical fruit trees and most of the European vegetables grow well in Polynesia.

Copra, vanilla and coffee are the main economic plants. The coconut plantations cover a total area of 117,980,465 acres, and produce annually some 30,000 metric tons of copra.[1] The Copra Stabilization Fund ensured the export of some 22,000 tons of copra during 1961, in spite of a marked drop in world prices. The *Institut Français de Recherches pour les Huiles et Oléagineux* (IRHO) has established a coconut experimental research centre on the island of Rangiroa, in the Tuamotu Group.

Vanilla, which was introduced in 1946, is traditionally an important part of the economy of French Polynesia. It grows well in the valleys of the volcanic islands, particularly on Moorea and in the Windward Islands. The annual vanilla production amounts to approximately 200 metric tons. Coffee is grown mainly in the Austral Islands, Tahiti,

[1] One metric ton equals 2,204.6 lb.

Below: The recent rapid growth of the tourist industry has stimulated traditional handcrafts. Right: The docks at Papeete, a regular port of call for the ships of Messageries Maritime and several foreign lines.



New loading jetty at Makatea, where phosphate deposits are mined. Annual production is approaching half a million metric tons.

Moorea, and in the Windward Islands. In 1959, coffee production amounted to 375 metric tons, but exports have since decreased (50 tons in 1961) because of the drop in world prices.

The Administration has organized agricultural branches which are responsible for studies and extension work on the methods by which cultivation can be diversified, and for developing production and encouraging the use of modern agricultural techniques. There are also two specialized agricultural centres which carry out research on cultivation techniques, one for high terrain, the other for low. To counter erosion on the mountain sides, a re-afforestation programme is being carried out.

Cattle Breeding

Since the total area of natural pasture land is small, cattle breeding is limited. In 1960, the cattle population of French Polynesia numbered approximately 10,000, with as many pigs. There are also sheep, goats and horses.

The Administration has opened an animal breeding and selection station for cattle and pigs, and thoroughbred animals have been imported. A modern poultry farm has also been established in Tahiti.

Fisheries

The South Seas are rich in fish, which is a main item of diet in French Polynesia. More fishing is carried out within the lagoon than outside the reef. As mentioned previously, there is a wide variety of species in the lagoons, around the reefs, and in the rivers. Fishing is mostly a family affair, and most of the fish caught is not marketed.

Nowadays, fishermen tend to organize themselves in co-operative type associations and purchase their equipment, using loans from the *Crédit de l'Océanie*. They supply the local markets with fish preserved on ice. A large-scale commercial fishing venture is being considered.

Pearlshell is one of the riches of the atolls, particularly in the Tuamotu Group—513 tons were exported in 1961 (780 tons in 1959).

Mining

Coal and chrome-iron have been found, but the only usable resource is the phosphate of lime deposit at Makatea. This has an exceptionally rich content, of the order of 82 to 85%. Mining is open-cast. In 1961, 410,000 metric tons were exported.

Industry

Light industry includes a coconut oil factory (300 tons in 1961, 1,200 tons in 1959) and a soap factory (95 tons in 1961, 160 tons in 1959). Both are at present affected by the drop in world prices of coconut oil.

Production in 1961 of grated coconut amounted to 460 tons. In the same year around 1,000,000 gallons of beer, 100,000 gallons of aerated drinks, and 3,000 tons of ice were also produced.

Three electric generating stations are in operation at Papeete (8,300,000 k.w. in 1961), Makatea and Uturoa. There is also a deep-freeze plant at Papeete.

Arts and crafts are being encouraged by the rapid expansion of the tourist industry.

In 1961 there were 8,600 tourists and 15,000 transit travellers, and this in turn is attracting investments in the traditional fields of industry. Whereas there were only 70 hotel rooms in 1959, there are now 400, and the building industry is booming.

Transport And Communications

Tahiti's international airport at Faa'a was opened on May 4, 1961. The runway, which is 4,000 yards long and 55 yards wide, is capable of taking the most modern jet aircraft. There are regular services with France (twice a week by TAI and Air France), New Zealand, the Samoan Group (TEAL), the United States (Air France and SPAL), and Australia. Inter-island air communications are maintained by a seaplane, for which 33 hydro-bases have been provided in the different groups, while a DC4 flies to Uturoa in the Leeward Islands. This last service was inaugurated in June, 1962. A project is at present under study to build other air strips which would enable medium aircraft to serve a greater number of islands.

Inter-ocean sea communications are provided by *Messageries Maritimes* and several foreign lines, while inter-island communications are maintained by schooner. The wharf at Papeete is 255 yards long, and can provide facilities for ocean liners. There are also 236,810 sq. ft. of storage space.

The larger islands have a road network (105.5 miles in Tahiti, 31 miles on Moorea, and 21.7 miles on Raïatea).

As regards broadcasting, Radio Tahiti has two 4 k.w. transmitters which broadcast simultaneously on 6,135 and 11,825 k.c., enabling programmes to be received in the most distant islands of the territory.

External Trade

French Polynesia's external trade is conducted mainly with France, countries in the French franc area, the United States, Australia and New Zealand. From these countries French Polynesia imports mainly foodstuffs, oil products, manufactured goods and raw materials.

In 1961, imports reached 85,000 tons, amounting to a value of 2,095,000,000 frs. CFP,[2] while exports totalled 392,200 tons valued at 1,035,000,000 frs. CFP. The exports were mainly phosphate (369,000 tons), copra (22,000 tons), pearlshell (513 tons), and vanilla (222 tons). In 1961, the value of these exports was augmented by 513,000,000 frs. CFP brought in by the very new tourist industry.

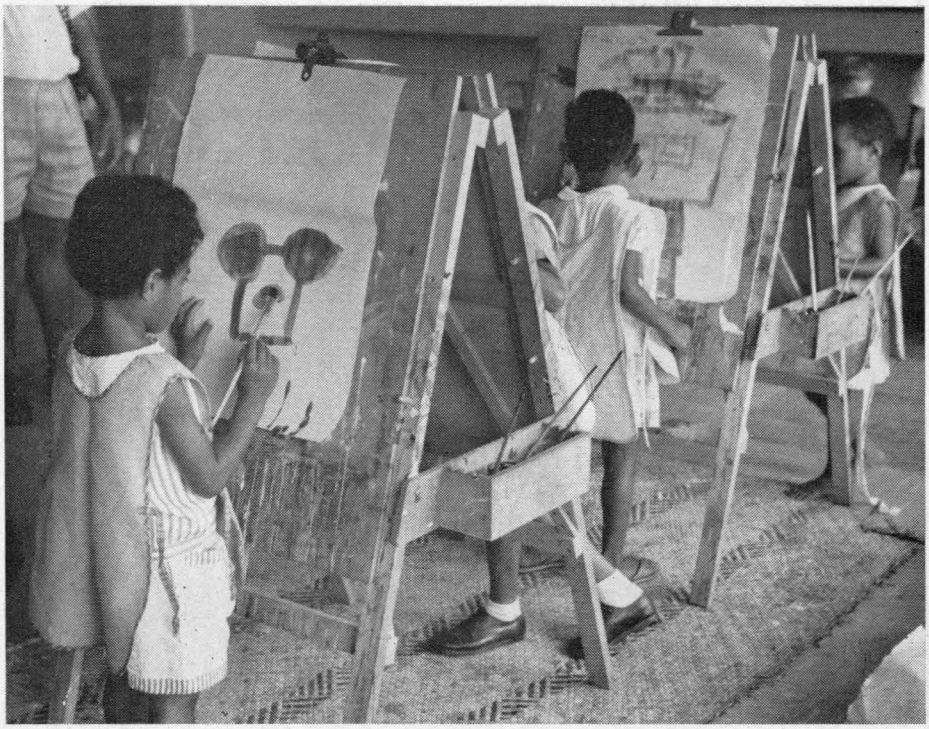
Public Finance And Investments

In 1961, the budgetary estimates of the territory were approximately 700,000,000 frs. CFP, of which approxi-

(Continued on page 72)

[2] 250 frs. CFP equals £stg.1.

Fijian and Indian children try their hands at painting on large sheets of paper with large brushes and bright colours.



YWCA Kindergarten For Suva

A multi-racial kindergarten opened in Suva last March by the Young Women's Christian Association is providing valuable pre-school training for children in the three-to-five age group. This article on the Kindergarten and its activities was contributed by the Directress . . .

ANNE WALKER

ON March 1 last a YWCA Kindergarten opened in Suva, Fiji. The idea had been put forward a year earlier by the Fiji YWCA Provisional Committee, and after much discussion a Directress had been employed from Australia, who came on the understanding that she would also assist the new General Secretary in the running of the emerging YWCA.

During the fortnight preceding the opening day premises were found—including a hall and a block of land—assistance with basic equipment was given by the Rotary Club, and a Fijian assistant was added to the staff. The Department of Education gave full registration for up to 60 children, though this number is far in excess of the number enrolled, as too large a group has an undesirable effect on children of the pre-school age. The total enrolment for the first month was 49 (24 girls and 25 boys), with an average daily attendance of 30.

During the year equipment has been gathered—some from Australia and New Zealand, and a small amount from England—but mostly from sources in Suva. From the Rotary Club's initial donations (which included two painting easels, building blocks, two table tops, a sandpit and a playground fence) a supply of manipulative equipment, dramatic play material and other constructive and creative aids has gradually been built up. Much has yet to be done—the main task being the procuring of permanent premises, where pictures, paintings and other teaching aids can be attached to the walls—but a very good start has been made.

The bulk of equipment used comes from waste material, adapted with some ingenuity; very little money has been spent. However, much more equipment is needed, especially for the second-year pupils.

Main Aims

The Kindergarten provides a programme that encourages the children's natural ability, gives them an opportunity to use creative materials and so become proficient with their hands, and increases their awareness of the world around them. Through group activities the children learn to co-operate with each other, to concentrate for short periods and to lose their self-consciousness, thus preparing them for the school life that is to follow.

It can be seen that the whole aim is to produce well-balanced, independent persons who could well be of great assistance in the community in later years.

The Daily Programme

The morning is divided into a definite routine, an important factor in giving the child a sense of security and confidence. A normal morning's plan is as follows:

News time and discussion.	8.30 ..
Outdoor play.	9-10.15 ..
Music and movement for half of the group.	9.45-10.15 ..
Toilet time.	10.20 ..
Milk and fruit.	10.30 ..
Singing, finger plays, poetry.	10.45 ..
Indoor play.	11-11.45 ..
Story.	11.45-12 ..

Building with blocks is a favourite occupation.

Children cutting and pasting with brightly coloured papers, supervised by Laite Mate, the Fijian assistant. Author at left.

The programme every morning is essentially the same, varying slightly on rainy days, of course. Usually a theme runs through the morning; for example, "ships", with perhaps an excursion to the wharf for three or four of the older children, or "planes" with pictures, or "workers in the community", and so on. Indoor activities include a variety of occupations to encourage creative imagination and manipulative ability—such as painting on large sheets of paper with big brushes and bright colours, cutting and pasting with small scissors, manipulating boxes, reels and string, block building, large crayon drawing, dramatic play with dolls and tea set and cradle, dressing-up, and so on.

Manipulative play is always very popular and needs considerable equipment to allow for regular changes to keep the children playing with interest. By making jigsaw puzzles, threading large and small beads of different colours, fitting together blocks, sticks and wheels, matching colours and handling smaller materials—their eye-hand co-ordination is improved and their thinking powers stimulated.

Outdoor activities include climbing to strengthen large and small muscles, swinging, building, carpentry, sand-play and running around. Nature interests are encouraged. Informal groups are possible for singing, discussing, poetry reading and other activities, and every opportunity is given for social, mental and physical play.

One of the most interesting aspects of the Kindergarten is its multi-racial nature. Any child between three and five years is eligible for enrolment, although unfortunately all those who apply cannot be accommodated. Fees are paid by all to cover the expenses of rent, staff and other essentials.

In the first term there were 10 Fijians, 17 Indians, 17 Europeans, four part-Europeans and one Chinese, while the second term resolved itself surprisingly into 13 Fijians, 13 Indians and 13 Europeans, as well as one Tongan, one Chinese and two part-Europeans. Frequent fluctuation of personnel is caused by children going on to school or leaving the colony for periods.

An important part of the Kindergarten work is the establishment of closer ties between home and school, parent and teacher. The programme is designed to supplement the child's home life, not to be a substitute for it.

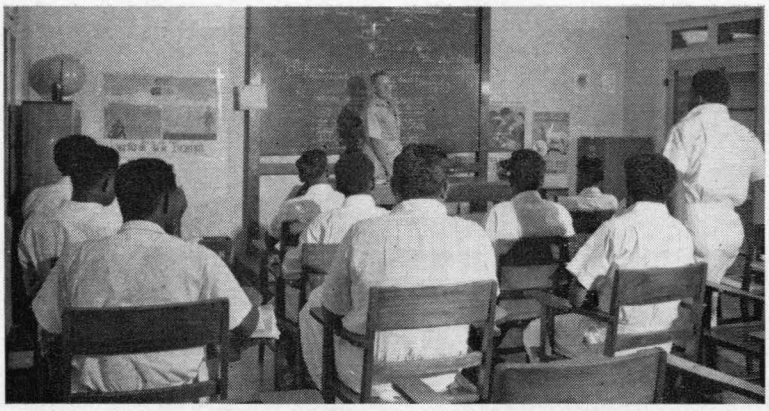
For this reason a Mothers' Club has been started, and once a month parents come to the Kindergarten after hours to hear talks, see films, and have discussions on children's needs and problems. Home visits are made where possible, and parents can approach the Directress at any time for advice and help with any problem connected with their children. A voluntary helpers' roster also brings mothers to the Kindergarten to assist during the morning and they are encouraged to take part in general YWCA activities. In this way quite a large number are drawn into the life of the community who would otherwise have little to do with it.

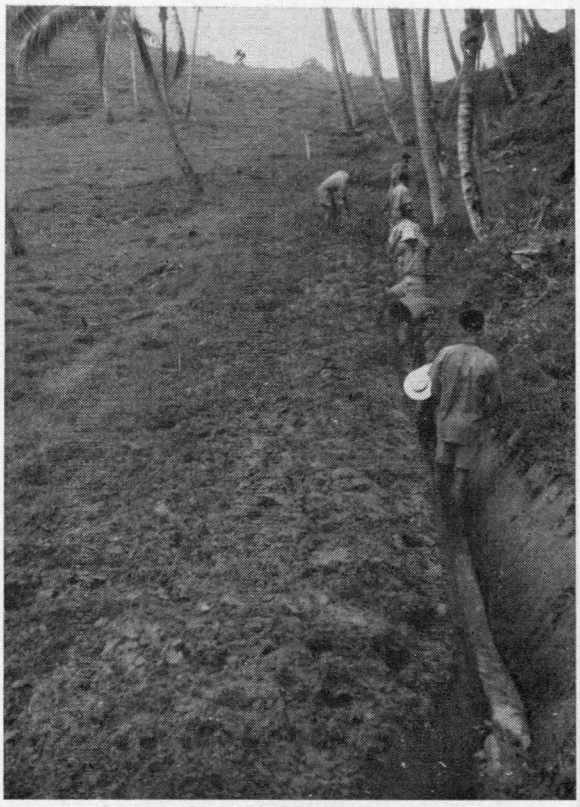
Coconut Research Station For The New Hebrides

Methods of improving the yield of New Hebridean coconut plantations, mainly by means of plant selection and the use of fertilizers, will be studied by a coconut research station being established at Santo, in the New Hebrides, by the *Institut pour la Recherche des Huiles et Oleagineux*. The work will involve extensive soil and leaf analyses to determine deficiencies needing correction by fertilizers. The Director, M. Manciot, was formerly engaged for similar work for the IRHO on the Ivory Coast, West Africa.

Since 1959 the South Pacific Commission has financially assisted a similar IRHO station set up on Rangiroa Atoll in French Polynesia.

Indian, Fijian and European children playing with plastic blocks.





Theory and practice. Above, the Principal of the Institute lectures first-year students on elementary genetics, while, right, students learn how land can be reclaimed, or greatly improved, by proper drainage.

The Koronivia Farm Institute

At the Koronivia Farm Institute, specially-selected students are trained as agricultural extension workers for the Fiji Department of Agriculture. The syllabus provides for a balanced programme of formal lectures, demonstrations, and practical experience. This account of the all-round intensive training given was contributed by . . .

R. L. HARTLEY*

IF a small country is highly specialized in the production of only one or two agricultural products, and if market trends are likely to remain unchanged, then associated agricultural training of farmers and workers concerned could be comparatively easy and inexpensive. It may even suffice for selected apprentices to work and learn on the best of such commercial specialist farms, providing a few highly-qualified professional staff are available in the country for passing on the latest research work in all aspects of production.

Unfortunately, few, if any, countries are in such a happy position. The farmer must be a good all-round man, with a fair knowledge of mixed farming suited to his particular environmental conditions. It follows, therefore, that the extension services must be able to provide skilled and experienced advice on a wide variety of agricultural problems connected with both crop and livestock production and with knowledge in advance of that normally available to the farmers.

In Fiji, the members of the extension staff who are in close and regular contact with the farmers in their particular districts are the Field Assistants, and they must therefore be good all-round men. Their work is supervised and checked by senior officers who maintain close liaison with specialist officers, but obviously formal training is essential.

The kind of formal training to be devised in any country will depend largely on the existing level of general education. When the level is low, it will have to be limited to practical work and the teaching of a variety of skilled operations such as budding and grafting, pruning, pest and weed control, milking, bullock handling and tractor driving, the idea being that the trainees will still have to be under more or less constant supervision when they join the extension staff.

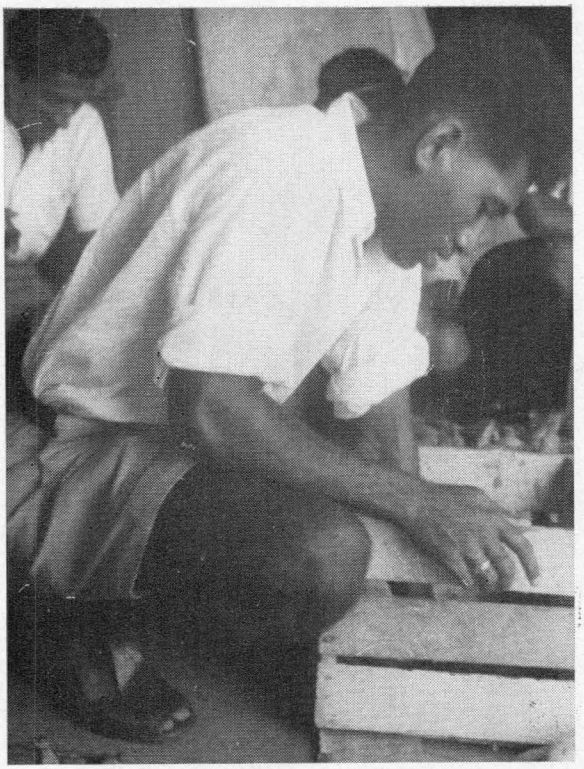
In the early days of the establishment of the Department of Agriculture in Fiji, the need for training of local staff was obviously realised, and sporadic attempts on these lines were made. But the subsequent results in the field were of doubtful value, as were those from certain other non-Government organizations, which offered training on similar lines in pre-war years. (The training farm at Drasa, established by the Colonial Sugar Refining Company Ltd.—now the South Pacific Sugar Mills Ltd.—confined its activities almost entirely to sugar-cane, the main crop of the district, and results were therefore somewhat better.)

It was not until 1946 that the establishment of the Koronivia Farm Institute received serious attention, nor until 1954 that the first two-year course actually commenced with the first intake of ten resident students.

By this time the general level of education in Fiji was such that it was possible to lay down minimum standards for entry. Today, applicants for admission must have passed the Fiji Junior School Certificate as a minimum qualification. Preference is, however, given to those who have passed the Senior Cambridge Examination. The higher the grade of pass the better, additional salary increments being allowed for the most successful of the students, who are subsequently employed by Government. In addition, it was found desirable—and proved advantageous—to require those selected for interview to pass a special Departmental examination in basic English and arithmetic.

The interviews are conducted by the Principal and a senior member of the Department—either the Deputy Director

* Mr. Hartley, who is Chief Agricultural Officer, Fiji Department of Agriculture, was Principal of the Koronivia Farm Institute from 1955 to 1959.



Above: A student learns how to drive a small tractor. After all have had their turn, they will be shown how to attach and use various implements.

Left: Banana growers often lose heavily by packing sub-standard fruit that is later rejected by inspectors. Here, students are practising selecting and packing bananas for export.

or the Senior Agricultural Officer in charge of extension work. A points system is used to obtain fair, comparative appraisals of the general personality and characteristics of the applicants for studentship.

It is not proposed to describe the many details concerning regulations, discipline, residence, catering arrangements, timetables, etc., as such information is available from the Department of Agriculture's profusely-illustrated Bulletin No. 33, *The Koronivia Farm Institute*. A word about the location of the Institute, however, is of interest because it has a direct bearing on facilities for instruction.

Location Of The Institute

It was decided to establish the Farm Institute at the Principal Agricultural Station, Koronivia (now re-named Koronivia Research Station) on the main Suva-Nausori highway, eleven miles from Suva. This is in the wet zone of Fiji, average rainfall being 130″ per annum. Factors influencing this choice included the wide variety of crops and livestock produced on the Station farm, and the considerable amount of research and general experimental and demonstration work undertaken. Partly for these reasons also, a much wider range of agricultural machinery and implements is maintained than would be on the average small commercial farm.

The availability of the permanent staff of skilled and semi-skilled labourers supervised by Field Assistants and Field Officers of the Department was also an important factor which was taken into consideration, providing more facilities and time for direct instruction without the farm suffering economically. The students at Koronivia follow a duty roster system whereby each one in turn is given experience in all the various branches of farm work such as growing bananas, cocoa, rice, and root crops, grassland cultivation, cattle, pigs, poultry, etc.

Last but certainly not least was the availability of specialist officers stationed at Koronivia, with whom the Principal of the Institute would maintain very close liaison, thereby keeping all instruction right up to date. This is naturally of importance in all subjects but it is especially so for subjects such as weed control and entomology, involving information on the chemical and biological control of weeds and insect pests, where, in the matter of a year or two, the subject matter could, without revision, be hopelessly out of date.

Due to the lack of a sufficiency of local textbooks, these specialist officers prepared lecture notes, cyclostyled for distribution to the students. In consultation with the Principal, they are kept up to date. Since the establishment of the Institute in 1954, many bulletins and farmers' information leaflets on a wide variety of subjects have been published, and now form a valuable addition to the College library.

Much is to be said for students running their own farm as an economic unit. However, the number of students is relatively small (twenty), and the need for the wide range of activities and experience mentioned, and the time required for regular excursion visits to commercial farms away from Koronivia and to other parts of Fiji in the intermediate and dry zones, must all be taken into account. (Agriculture in these and other zones of Fiji is, of course, very different from agriculture in the wet zone in which the Institute is situated and, of course, Departmental staff may be posted to Divisions in any of these areas.)

Consideration of all relevant factors made the decision to utilise the facilities at Koronivia inevitable. However, to compensate to some extent for students not being able to run their own farm entirely, they are given both individual and collective responsibility for managing various economic projects. For this purpose each student is given a small area of land for cropping on a rotation system, and on an economic basis. The students use part of their limited spare time for these projects, and themselves pay for obtaining and using such things as planting materials, fertilizers, insecticides and fungicides. In return, however, they are allowed to sell their produce—mostly vegetables—to the Institute and to private buyers. Accurate costings are maintained throughout.

Students maintain diary records of all practical work carried out for these economic cropping projects, of general farm work, and of all field excursions and demonstrations.

Every year, students are obliged to collect specimens of the declared noxious weeds of Fiji and of other specific plants.

A demonstration of the propagation of citrus by budding.

Right: After the budding demonstration this student is practising on a convenient plant. He is wrapping the bud after inserting it.

These are neatly prepared, relevant notes attached, and the whole mounted in attractive 'home-made' albums.

Pass In Practical Work Compulsory

The quality of the students' work has been very high, and has invariably won acclaim from visitors. The last output of students from the two-year course was at the end of 1962. Up till this time the rule has been that no student may pass the Grade I Certificate in Tropical Agriculture unless he passes in practical work, regardless of how well he may have succeeded in written and oral examinations. (Subjects for the latter comprise crop husbandry, general agriculture, extension methods, economics, botany, entomology and plant pathology, weed control, engineering, soil science and fertilizers, elementary forestry, animal husbandry, dairying and veterinary science.)

Some idea of the importance which has always been attached to practical work may be judged from the fact that 50% of the overall marks are allocated for it. Marking is done for specific tests of practical skills, for records maintained by each student throughout the course, and for the students' diaries and plant collections, etc.

Nearly all subjects of the curriculum are taught by the Principal and Supervisor, both of these posts being filled by qualified agriculturists with special teaching experience or actual teaching qualifications.

A most important point always insisted upon is that all final examinations must be conducted by external examiners (actually the specialist officers), code numbers being used instead of names of students, so that any favouritism—conscious or otherwise—is impossible. The subject, extension methods, was at first taught as opportunity occurred during lectures on crop husbandry and other topics, but later it was introduced as a specific subject of the curriculum, thus emphasizing its importance. This was considered necessary since the majority of successful students are employed in the extension services of the Department of Agriculture.

The fact must be faced that some officers, although adequately qualified technically, do not make good teachers or extension workers—a fact by no means peculiar to Fiji. However, although some officers may excel due to special personality characteristics in addition to their knowledge and efficient application of extension methods, the efforts of all can be greatly improved if they receive formal training in extension methods dealing with applied psychology and teaching methods, etc. Further information about the syllabus for this particular subject is therefore appropriate.

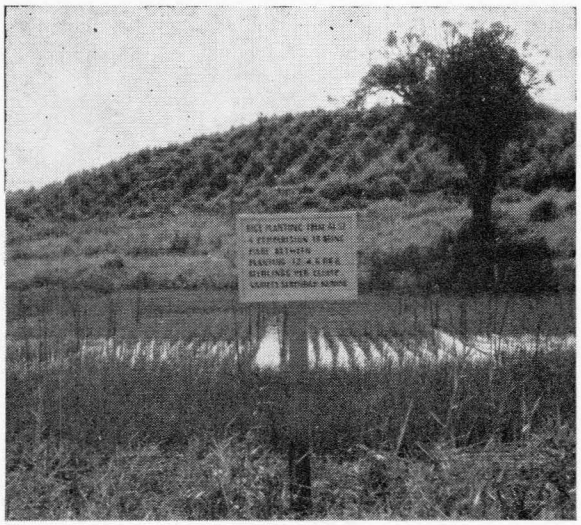
The Syllabus

The syllabus provides for a balanced programme of formal lectures, demonstrations and practical experience. Lectures deal firstly with basic qualifications required of the extension worker—for example, general qualities such as enthusiasm, persistence, patience, determination and the will to succeed, confidence born of experience, keen observation, impartiality, loyalty, humour, friendliness, tact, commonsense, presentability, courtesy, punctuality, methodical system of working, self-discipline, energy and drive, a healthy and strong physique, organizing ability, leadership, adaptability, sound judgment, integrity, and respect for others.

Each of these qualities is dealt with in detail. Examples are given of the need for and the application of, such qualities in practice and the unfortunate results which can, and do, arise when they are lacking. The need for a strong physique, for instance, leads to discussion on the arduous duties of the extension worker and his need for the ability to stand up to long hours of work, often far beyond normal working hours. He also must be able to stand up to difficult travelling conditions that frequently involve walking in deep mud, traversing mountains, horse riding, shooting rapids in dugout canoes or on bamboo rafts, and travelling by sailing canoe in rough seas, and he must nevertheless be ready for active demonstration work on reaching his destination. He must also be prepared to be away from home for long periods.

Elementary study of psychology and its application to rural communities follows. Then the need for formal, allround agricultural training and its application is discussed; likewise for in-service training and the local refresher courses which are now held at three-yearly intervals for each of the four Administrative Divisions of Fiji, each with an Agricultural Officer in charge of the extension services maintained therein.

After this necessary introductory approach to the subject, detailed informa-



Left: This rice-planting trial was carried out entirely by the students, who take an active part in the experimental work conducted at the Koronivia Research Station nearby.

After ploughing comes the cultivator. Each student is tested regularly on his knowledge of attaching and using such implements.

tion is given on recognized extension methods covering, for example, individual farm visits, group visits, mass methods—in particular their local application, since what is suitable for one country or locality may be quite unsuitable for another.

Mention is made of the fact that natural objects, the spoken word, the written word, and the picture, are best used in a variety of forms and combinations; also that individual farm visits are generally considered to be the most expensive form of extension methods, particularly where staff shortages exist. But experience in Fiji shows that concentration and sustained efforts by such visits in strategic areas for the development of model or demonstration farms, often established by special local committees, has nevertheless brought rewarding results at less cost compared with negligible achievements when these and group or mass efforts have been spread over the vast areas which each extension worker has to cover.

An explanation is given of how such model commercial farms give full opportunity to make use of the fact that people learn by seeing, hearing, reading, discussing and doing, and the value of utilizing a combination of all these methods.

The lectures explain how the extension services of the Department are constituted and their activities co-ordinated with those of the research stations and specialist staff of the Department, so that all work as a team. They also detail the necessity for co-operation with other Government departments and demi-official bodies.

Of special value—and of increasing importance—are the radio broadcasts in their various forms which, due to the employment by the Fiji Broadcasting Commission of a qualified agriculturist trained in radio broadcasting techniques, are of a very high standard indeed.

Again, the increasing importance and absolute necessity for the closest co-operation with the new Land Development Authority in Fiji is discussed.

From the beginning of 1962 a system of Farm Index Card recording was put into operation. These cards record comprehensive information which in the course of time will provide a very useful guide in evaluating the effectiveness of the extension services in all parts of Fiji.

Proper housing for livestock is essential. The various types of housing provided for cattle, pigs and poultry at the nearby Koronivia Research Station provide valuable facilities for instruction. In this picture, students are studying one of the portable arks which house the growing chickens brought from the brooders.

Quite apart from this, the filing system ensures continuity of efforts regardless of inevitable staff changes.

The need to respect the local customs of the different races of people in Fiji, and the effects of this on correct methods of approach, are not ignored.

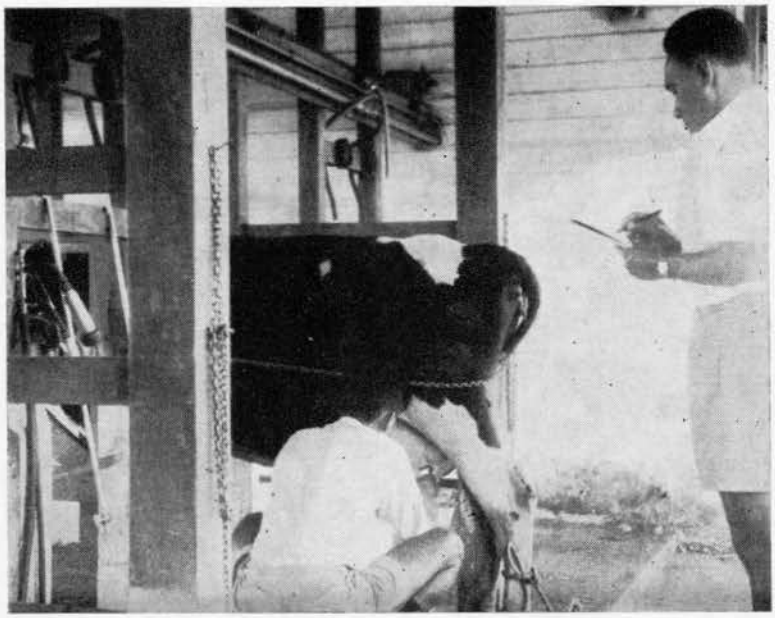
Demonstrations and practice are held, both on the Institute plantations and on commercial farms. During the former, staff sometimes act as difficult, ignorant or extremely conservative farmers, while students are obliged to act in turn as Field Assistants approaching such farmers to advise them on the spot on a wide variety of problems. Such procedure not only imparts practical experience in extension methods but also helps to build confidence. Students are, with few exceptions, shy and hesitant during early exercises of this kind. A similar procedure is adopted for the final oral and practical parts of the examinations in extension methods.

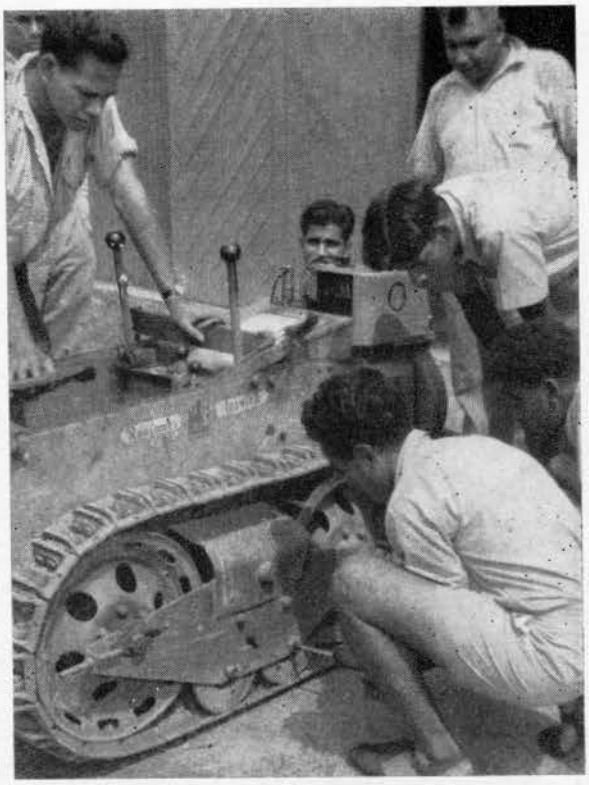
Farm visits are organized with local experienced extension personnel to permit students to observe, at first hand, routine extension duties being carried out. Farmers' Clubs are visited and, under expert supervision, students act as judges at Junior Young Farmers' Club shows.

Instruction is given on the correct organization and conduct of meetings of farmers. Another somewhat difficult matter dealt with is the position of the extension officer in relation to non-observance by farmers of agricultural legislation—for example, on soil conservation, declared noxious weeds, etc. He is shown how best he may do his duty without endangering the necessary friendly relations with the farmers concerned.

The syllabus in extension methods covers such matters as programme planning and the need to have both immediate and long-term plans sufficiently elastic to enable amendments to be made, if required, to meet changing economic conditions.

The planning from start to finish of detailed itineraries for tours of duty in





Above: A practical test in hand milking.

Right: Students are taught to maintain as well as to use tractors and other farm machinery.

various parts of Fiji, dealing with various communities, is a feature of set work and tests. Early tests on these matters revealed the fact that the majority were very weak in such work. They were also frequently found to be poor in adapting their technical knowledge to solve a variety of problems in varying conditions and circumstances which, as Field Assistants, they would inevitably have to face sooner or later. In the author's opinion, this is mainly due to the parrot-like learning methods followed in early school days with the sole object of passing examinations of the kind where knowledge of facts suffices.

* * *

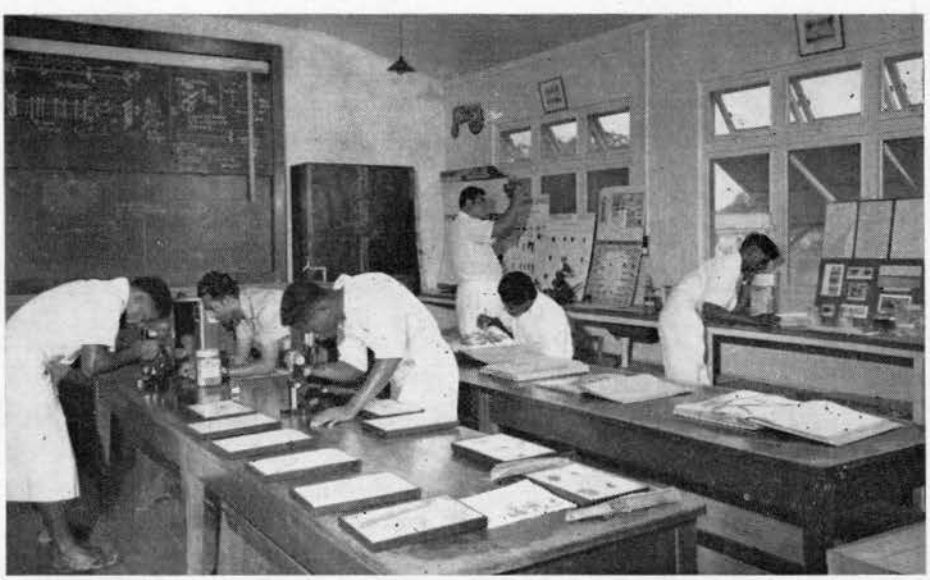
The Koronivia Farm Institute is soon to be re-named the Fiji School of Agriculture. In keeping with the implied more advanced status, a number of important changes have taken place.

The Course has now been extended to three years, and students spend the first year at the Fiji Health Department's Medical School, where the subjects taught comprise physics, chemistry and biology, with supplementary English and mathematics up to General Certificate of Education (G.C.E.) standard. This serves not only to level up the training of students coming from different schools, where, for example, some take chemistry instead of physics, but it also allows students more time to get straight on to agriculture proper and applied agricultural sciences in the second and third years, at a more advanced level.

In the latter part of the third year it is hoped to be able to allocate some time for special work for students desirous of specialization if they show a definite aptitude and bias of interest towards, for example, a branch of animal husbandry work.

A Board of Studies has been established. It will meet periodically to review progress, to institute any improvements considered necessary from time to time, and to deal with any particular problems that may arise. The Board consists of the Director of Agriculture as Chairman, the Principal of the Institute as Secretary, and senior staff members representing the various specialist services.

The institution has come a long way since 1954, and has made steady but consistent progress which we are confident will continue in the future. The Farm Institute has long since shown its great value in the form of vastly-improved services to the farmer resulting from the employment of well-trained staff. The quality of the training to be given at the Fiji School of Agriculture with its extended course should be still further improved.



At left, students are examining diseased plant tissues. They also study specimens of common insect pests, beneficial insects, pollen grains, spiracles of rhinoceros beetle larvae, etc. In the foreground are books containing individual plant collections made by students, while, in the background, students are examining internal combustion engine parts and specimens of healthy and diseased animal tissues.

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INTRODUCTORY

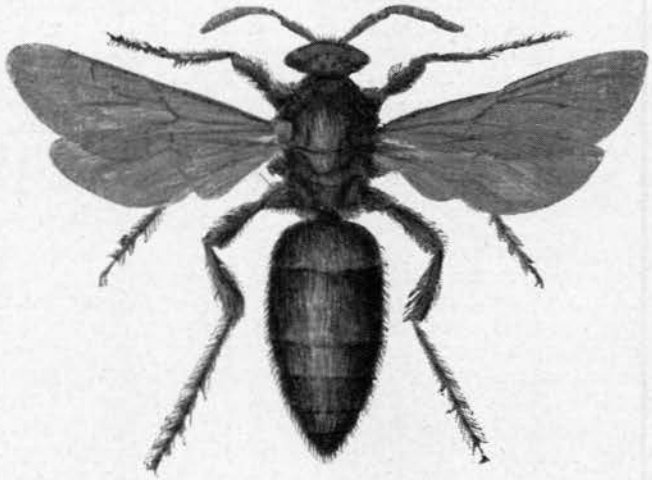
In 1945 the wasp Scolia ruficornis, *a parasite of rhinoceros beetle larvae, was introduced into Western Samoa from Zanzibar by Mr. H. W. Simmonds. Following its establishment in Samoa, other collections of this parasite were made in Zanzibar and sent to the Palau Islands and to New Britain. In both of these places the wasp readily became established.*

In 1953 the rhinoceros beetle Oryctes rhinoceros *became established in Fiji, and in May 1958 a colony of* Scolia ruficornis *cocoons was sent from the Palaus to Fiji and released in large sawdust, compost heaps which were stocked with* Oryctes *larvae.*

Mr. Simmonds has described the discovery and introduction of Scolia ruficornis *into Western Samoa, the Palaus and Fiji in an article entitled* Interim Report On Scolia Ruficornis In Fiji, *published in the* SPC Quarterly Bulletin *for July 1959. A further account of some aspects of the biology of this wasp is given by him in a* Further Note On Scolia Ruficornis In Fiji, *which appeared in the* SPC Quarterly Bulletin *for October 1959.*

In the following note, Mr. Simmonds presents some observations and views concerning aspects of the behaviour of Scolia ruficornis *and factors limiting its abundance in Fiji.*

C. P. Hoyt
Entomologist, South Pacific Commission



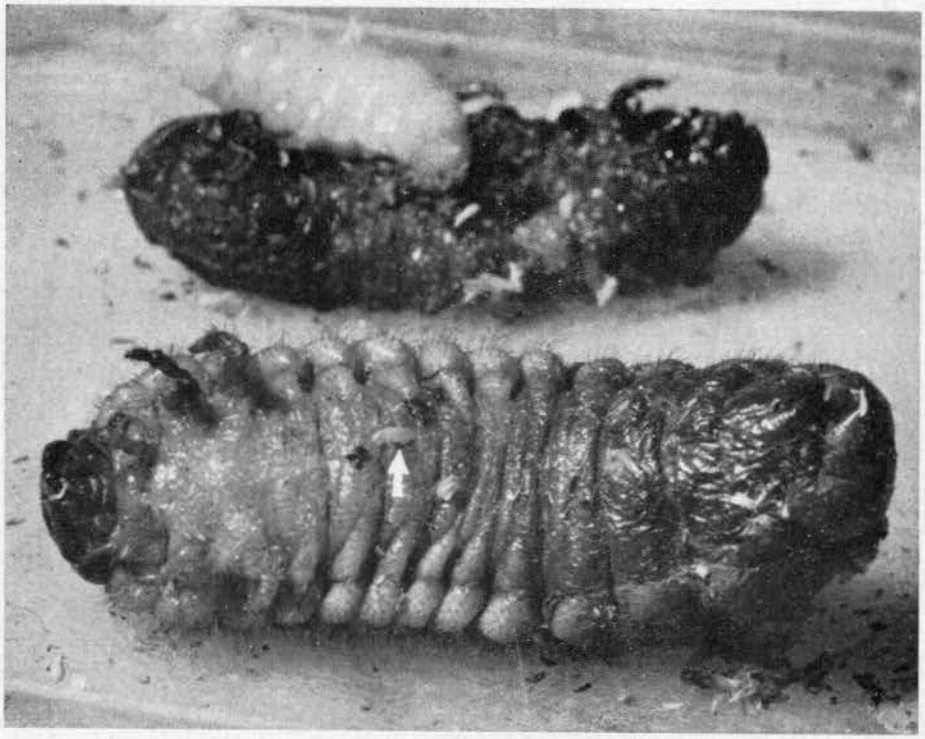
Scolia ruficornis, about twice natural size. Reproduced from a colour drawing by the author.

A FURTHER NOTE ON . . .
Scolia Ruficornis In Fiji

A GOOD DEAL has been said about the homing instinct of *Scolia ruficornis*, and there is no doubt that once a female has located a compost heap containing grubs suitable for her purpose, she will return there to oviposit several times, showing no interest in other similar heaps close by. As an instance of this, four paralysed grubs with unhatched eggs on them were found in one heap, with the female wasp asleep in the same heap. There were no other larvae or pupae of the parasite present, nor were there any in the adjoining compost heaps. These eggs hatched on the next three successive days, the fourth being lost, so that there seems no doubt that all four indicated a visit by the same female on four successive nights.

On another occasion ten early stages of the parasite were found in the same heap, ranging from egg to hardened cocoon, with nothing in the adjoining heaps. As this wasp takes from ten to twelve days to go through to hardened cocoon in this climate, it indicated strongly that all were the progeny of the same female.

However, there is no doubt that a considerable percentage of the females wander away from where they were born, although I have no figures to indicate this. But in Zanzibar, marked males were recaptured, twenty-four hours after release, three miles away. In Samoa this parasite was first recovered twenty-six miles from point of liberation, three years later.



Scolia ruficornis attacks its host (Oryctes rhinoceros) when it is in its third instar, shortly prior to pupation, following the beetle grub far down into the soil. The egg (arrowed in photo) hatches within a few hours, and the growth of the larva (in background) is remarkably rapid, the whole period from egg to hardened cocoon taking only about nine days under tropical conditions.

In Fiji, ten weeks after examination of one of the cocoon heaps (but where all the cocoons were over five weeks old) re-examination showed that about 32% had emerged, 45% had died in the diapause stage, while the balance were still alive in the cocoons. As the adults live for four or more months there should have been a considerable number flying about, but this was not the case, suggesting that many had not found their way back after their search for food. A week later, however, their numbers had increased considerably, suggesting either that some had found their way back, or that some had returned from a nearby breeding place.

This scattering is the only reason that I can offer for the fact that colonies placed at Wainadoi, Raralevu and Korovou—all of which are known to have bred a generation in these localities—have in no case been shown to have continued breeding there. The Raralevu colony found and used a heap two hundred yards from the one in which the cocoons were placed, and it can only be presumed that, in their search for food, they wandered so far that they did not return to the locality where they emerged.

A colony placed at Deuba, some twenty miles further along the coast from Wainadoi, was largely washed away, but not before a considerable number of the cocoons had emerged. In this case there is a record, which should be reliable, that an adult was seen flying three years later. If this record can be confirmed, it would definitely indicate that the parasite is established.

There are two main reasons why this wasp has proved much more difficult to establish in Fiji than in Samoa or the Palaus. The first is the thin nature of the beetle population as compared to those countries, and the second is the fact that the favourite breeding places for the parasite—sawdust heaps—are everywhere poisoned. It means that any wasp wandering away from our nurseries—and large numbers must have done so—will in many cases enter sawdust heaps and perish.

Mites A Problem

While the heaviest mortality of the parasite in our breeding technique is in the diapause condition, it hardly seems that in nature it can reach the high proportions that it has in our work. However, it has now been found that under our breeding technique, mites have been playing a serious part. These attack the newly-hatched larvae of the parasite, although normally they seem to feed upon the old larval and pupal skins. As we had been in the habit of using the same compost several times, it enabled a mite population to grow to considerable proportions.[1]

[1] All compost is now being steam-sterilized, and only used about twice.

In a collection of seven grubs carrying parasite eggs, three were destroyed by mites, while the fourth was also found to have newly-hatched mites upon it. A dead cocoon was also found to contain a mass of mites, so that they may also be a factor in the heavy diapause mortality.

Mongoose Also A Pest

It is now realized that these pests are even more troublesome in the work than was formerly supposed. In order to prevent them entering the boxes of compost, wire netting of $1\frac{1}{2}$" mesh was placed over the latter, but it is now found that a mongoose must even be able to get through this, and a finer mesh will have to be substituted. However, if too fine it could deter the parasite from entering.

Incompatibility

Although this is a botanical term, I think it can be used equally well here, as indicating an incomplete adjustment between the parasite and its host. It must be remembered that *ruficornis* is a parasite of African species of *Oryctes,* and in advising its trial against the Asiatic *O. rhinoceros,* I had to point out that there might be some adjustment due to the sting of the adult wasp, or the salivary juices of its larva, proving fatal to the host grub. The evidence indicates that this has sometimes been the case, and that even now they are not perfectly adjusted. From time to time we come across cases in which the host grub has died before the parasite larva is more than half grown.

A striking instance of this was a case in which, out of seven parasitized grubs, undoubtedly all attacked by the same wasp, three died when the parasite larva was only about half grown.

Seasonal Nature Of The Wasp

Although a certain amount of breeding continues throughout the year, in Fiji the wasp is decidedly seasonal, reaching its peak about December. The parasite requires fully mature grubs, nearly ready to pupate, upon which to oviposit, and we have frequently found that to obtain these it will bore through the pupal cell of the grub to attack the inmate. In doing this it generally leaves a hole of about the size that a pencil would make, and when we see such a puncture, we know that there will be a parasite larva within.

* * *

Scolia ruficornis is now definitely breeding in one village about fifteen miles from any point of release, or from our nurseries, while reports, apparently authentic, indicate that it is breeding at three other places, all of which are within five miles of points where cocoons were placed two to four years ago.

Now that the poisoning of sawdust and compost is being restricted to strictly limited areas, this parasite should begin to increase.

SPC Officers On Official Visits

By invitation of the World Health Organization, Dr. Guy Loison, SPC executive officer for health, left Nouméa on November 12 for Formosa, to attend a conference on rural hygiene, at which countries of the Western Pacific and South-East Asia were represented. Dr. Loison called at Saigon, Bangkok, Hongkong and Manila for consultations with medical authorities and representatives of international organizations likely to be able to assist in the Commission's health programme. He returned to Nouméa on December 13.

Territories in the Commission area visited during November-December by Dr. Jacques Barrau, SPC executive officer for economic development, include Guam, the United States Trust Territory of the Pacific Islands, and French Polynesia. While in the last-named, Dr. Barrau called at the coconut research station on Rangiroa Atoll. Since 1959 the Commission has been assisting the work of this station with annual grants-in-aid.

SPC-Assisted Study Tours

Inter-territorial study tours assisted by the South Pacific Commission include the following:

MR. KESI ALE, a laboratory assistant in the Department of Agriculture, Western Samoa, visited the French Institute of Oceania, Nouméa, from November 29 to December 19 to study techniques for rearing *Platymerus rhadamanthus,* an assassin bug known to prey on the rhinoceros beetle.

MR. XAVIER SUE of French Polynesia also arrived in New Caledonia recently to join the French Institute of Oceania's research vessel ORSOM III. He will study longline tuna fishing methods.

MR. R. MANCIOT, Director of the Coconut Research Station being established in the New Hebrides by the *Institut pour la Recherche des Huiles et Oleagineux* (Institute for Research on Oils and Fats), visited the British Solomon Islands from November 19 to December 4 to study work on breeding being carried out at the Yandina Coconut Experiment Station.

MR. A. VAN ROIE, of the *Service de l'Elevage et des Industries Animales* (Department for Cattle Breeding and Animal Industries), New Caledonia, has gone to Fiji to study pasture improvement methods.

PICTURE CREDITS

Acknowledgement is made for illustrations reproduced in this issue as follows: Front cover, pp. 23, 27, 57 (bottom), 59 (top), Australian Official; 20, 22, E. P. W. Marriott; 24, 25, 26, 47, 48, 55 (bottom), 57 (top), 59 (bottom), Fiji Official (Rob Wright); 28, 29, 30, Michel Legand, Nouméa; 33, 34, 35, Jean Boixo, Nouméa; 41-46 incl., French Polynesia Official; 49-53 incl., R. L. Hartley; 63, 64, H. R. R. L. Cooper.

In Fiji, English lessons are broadcast regularly in the "English For You" series as part of a campaign to improve the standard of English in the Colony.

Community Education For The Pacific

Throughout the Pacific there is a keen and growing desire for knowledge of all kinds; for instruction on a wide range of subjects relating to home, village and national life. Realizing this, the South Pacific Commission is collaborating with the Food and Agricultural Organization of the United Nations and the Government of Fiji in the establishment of a community education training centre to serve the region. As an initial step, a homecraft training centre for island women will be opened this year in Fiji.

By MARJORIE STEWART*

* Women's Interests Officer, South Pacific Commission.

THERE are many definitions and descriptions of community education because of its wide and comprehensive scope. Primarily, however, the essence of community education is an awakening —a realization by a group that progress towards an improved standard of living lies to a considerable extent in their own hands, particularly if they get together to plan and then execute a project as a community.

Education The Essential Factor

The basis for informed action, whether for child or adult, is education—learning how to set about a practical task and acquiring the know-how before plunging into action. Education is the essential factor in the development of community initiative and potentiality, while the primary stimulus is the realization of a practical need and a desire for improved facilities such as a better water supply or new farming methods.

A group, for instance, may realize its need to break an oppressive retail monopoly within its area and a few come together to discuss possibilities. One who has been a member of a co-operative in another district expounds, perhaps crudely, the main idea of co-operation, but perhaps at least enough to stimulate the group into seeing that through combined effort and pooling of cash they can begin to solve their consumer problem, though ignorance may bring defeat.

Wisely they send for the busy co-operatives officer, who arrives eventually to discuss with them the many-sided problem of launching into retail trade. On his advice, and with the aid of simple, vernacular literature, they settle down to a period of some months to study, firstly, the principles of co-operation; secondly, its practice in other similar situations, and, thirdly, the particular aspect of co-operative activity upon which they wish to embark—whether it be a buying club or even a small shop, a producer co-operative for the marketing of their crops, or a credit union for the creation of group capital

At the Oriomo Agricultural Extension Station in the Western District of Papua, a group of young farmers receive instruction in triangular planting of coconuts.

Members of this sewing class belong to the Langa Fonua, a Tongan women's organization dedicated to progress in home and community.

by which they can invest in machinery for increasing their output.

Without this initial study the group is likely to run into many hazards and their venture to founder upon rocks totally unforeseen. While studying they may start the initial stage of a thrift club, adhering strictly to co-operative rules in even the smallest undertaking.

As another example, the women of the village may be stirred to action by a visit of a small group from another village who describe the activities of their women's club. They ask for help from the local women's work officer, and with remarkable concentration they settle down to a four-day course on the why and how of running a women's club, learning not only how to conduct the club and plan a homecraft programme using all available human resources, but also how to teach certain elementary practical skills—sewing, cooking, housecraft.

Not much can be done in four days, and the group soon realizes that it needs longer practical training for its new sectional leaders in these skills. An instructor, either official or volunteer, is invited to the district for a period of one to three weeks for concentrated teaching of the required subjects.

As in formal school education, notes accompany the lessons so that the adult student may carry away with her confirmation of all that she is learning as well as an outline syllabus of lessons which she can follow when teaching in her club; even when illiterate the woman will take the notes, knowing that her children are able to read them for her.

Again, it may be that a group of men has by some means become aware of the inadequacy of their planting operations. An enthusiastic agricultural extension officer meets with them, studies their predicament, discusses possibilities, gives them the necessary instruction bit by bit, and with new understanding they tackle their cultivation using hitherto untried methods. Not that they aren't sceptical—but discussion and study have gradually brought about a readiness to experiment.

Or perhaps the health of a village is steadily deteriorating, and although the reasons may be obvious, the people become more and more indifferent. A health extension officer tries the slower method of helping the village to face facts, through talks, posters, flannelgraphs, films and drama, concerning the cause of their illness, followed by practical suggestions for the cure. Indifference persists, but a small group begins to appreciate what might be done. Gradually they make headway, and the practical programme awaiting its cue in the wings is rolled swiftly on to the stage.

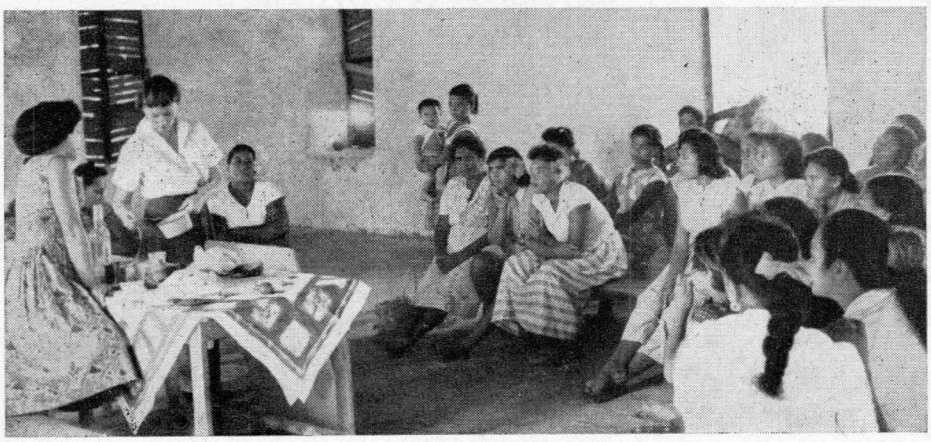
Pacific-Wide Desire For Knowledge

In the Pacific area there is a clamouring desire for knowledge; eagerness for instruction far exceeds available resources. The schools of course are crowded.

In the villages here and there the adults may have slipped into apathetic acquiescence with unsatisfactory conditions of health, home and housing, cultivation, and social and spiritual life. However, under the stimulus of a vital, well-informed purveyor of any of the community improvement commodities indicated above, there are always some who respond with alacrity, and who in turn stimulate the others.

Among the women in Fiji and elsewhere the desire for instruction is so keen that when they succeed in securing the services of a teacher they stay up all night rather than leave their handwork uncompleted. If the official channel cannot produce an instructor owing to widespread demand, a rural area will seek out one of their own who has been fortunate enough to have travelled and been trained in some practical skill. She is summoned to visit the home of her origin where for a week or more she is given eager hospitality in return for unstinted instruction.

Political change is increasingly a feature of Pacific life. Excellent educational material has been prepared in such places as Papua and New Guinea and the island of Niue for the enlightenment of even the simplest villager, and lessons are illustrated by well-tried visual methods.



Members of the Tautu-Vaipae Women's Club of Rarotonga watch while Miss Judy Lang of the South Pacific Health Service gives a cooking demonstration.

A member of the Vunadadir Local Government Council, New Britain, presenting a case for a community project. The native local government council system is playing an important part in the development of Papua and New Guinea.

In Papua and New Guinea, some five hundred married couples have attended residential courses in various aspects of community education, particularly the significance of local government and the task of the newly elected councillors.

In Fiji, both adult and school groups took a lively interest in a flannelgraph demonstration of the structure of the new Legislative Council and its mode of representation, as well as of Government revenue and expenditure. At the more advanced level, civil servants with a good basic education are attending classes, lectures and debates on various topics as well as making excellent use of recreational facilities — football, basketball, hiking may all be factors in community education.

Problems Of Adult Education

Adult education is in some ways a much more difficult task than school education. There is no compulsion. The adult is already busy with his daily concerns, and he has responsibilities which may prevent him from regularly attending any course. The instructor has no hold over the pupil, and unless he makes his subject of vital importance to the learners he will find their numbers dwindling after the first optimistic enthusiasm.

There is an increased realization that for community education to be effective, there must be a sound and imaginative training of the educators. Educators can be many and varied—professional or voluntary: extension workers in agriculture, health and hygiene, child care, housing, economics, co-operatives, homecraft, or administration officials at various levels; volunteers working with adult or youth groups.

The subjects for adult education are as numerous as the facets of life; the methods vary from the traditional lecture room to the simplest practical achievement for village improvement; it is primarily the learning-by-doing method that appeals.

The extension worker or volunteer leader is often at a serious disadvantage because, although he may know his subject thoroughly, he may have had no training in presentation of his material, in group methods, or in the process of provoking initiative. The adult educator, in spite of the difficulties of his work, may in fact have had nothing of the careful preparation of the classroom teacher.

Courses For Field Workers

Courses in methods of community education are now provided in many countries for all the varied band who go forth to work with both urban and rural groups, seeking through the principle of self-help to bring about improved conditions. The training curriculum for those already proficient in their own professional subject or practical skill includes:

1: THE ART OF COMMUNICATION—

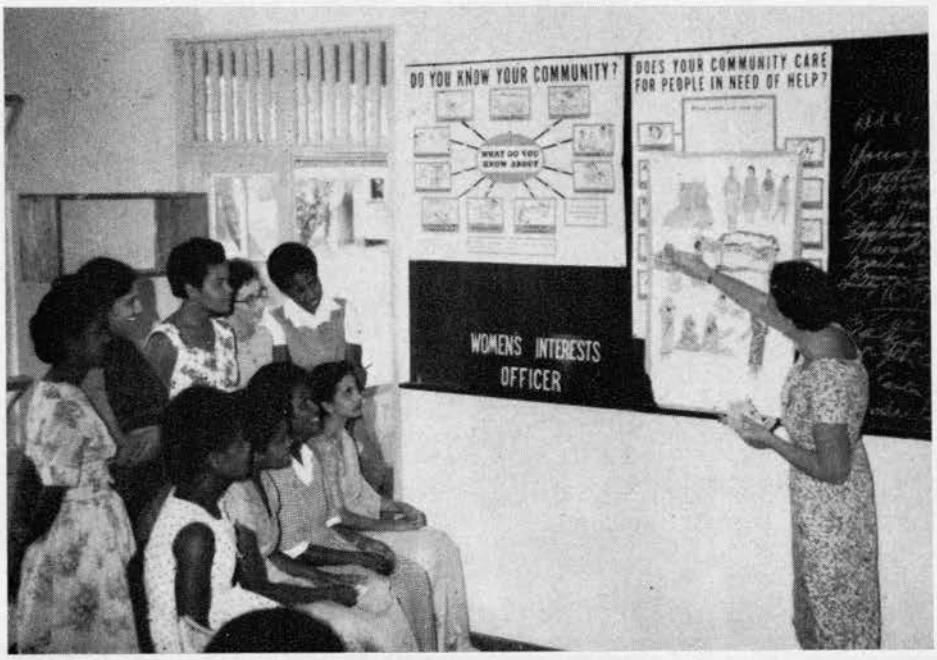
(a) preparation and presentation of a total syllabus as well as separate lessons;

(b) the use of visual and dramatic aids;

(c) methods of encouraging participation.

2. GROUP DYNAMICS—a study of the various kinds of groups as well as of group reactions; group stimulus; group commitment; group organization.

Such a course for trained field workers might last for anything from a fortnight to three months, according to various determining factors. For those who have to learn not only methods of communication and group organization but also their basic practical skills, such as homecraft, the course should last for at least one year. For both groups the practical sessions would include the planning and



Women attending a club leadership course in Suva, Fiji, watch while Miss Ruth Robertson, Women's Interests Officer for the Colony, demonstrates a flannelgraph.

Young people attending a youth rally in the Cook Islands listening to one of a series of lectures on community development.

making of a study kit related to the subject to be taught, and supervised field work followed by tutor-student assessment and discussion.

Permanent Training Centre Planned

Here and there in the South Pacific there are instances of field personnel trained in the principles and practice of community education, but in the main there has been little opportunity to gain this knowledge.

Realizing the increasing desire throughout the islands for instruction in a wide range of subjects concerned with home, village and national life as well as international events, the South Pacific Commission is collaborating with the Food and Agriculture Organization and the Government of Fiji in the establishment of a Community Education Training Centre for a wide variety of field staff, the initial step in the plan being a Homecraft Training Centre where courses will be offered for island women preparing for the task of Area Organizer for Women's Interests.

The Course, which will include homecraft skills as well as community education methods, will last for one year from mid-1963, and will be centred in Fiji. Plans are developing more gradually for the establishment of a permanent comprehensive Training Centre in Community Education.

Palolo Prediction Proves Accurate

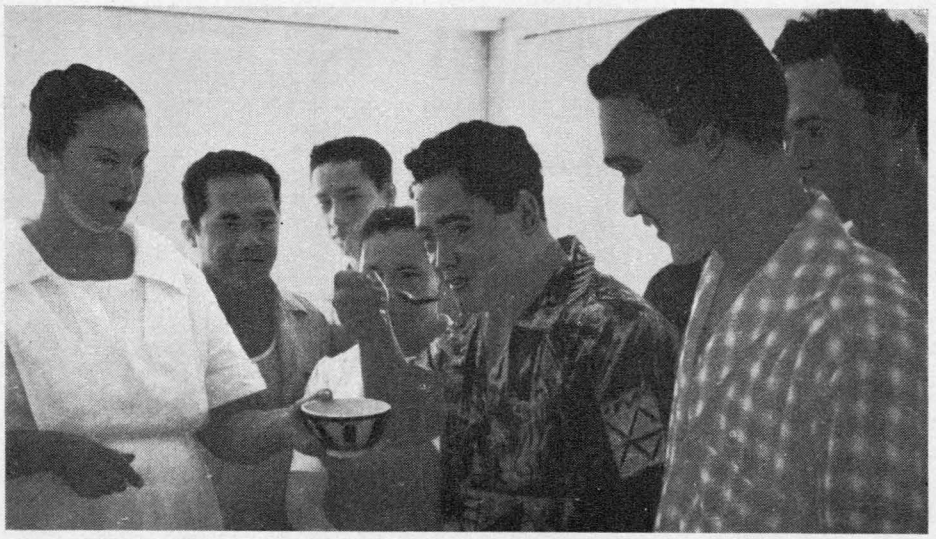
In the July issue of the *South Pacific Bulletin*, an article appeared entitled "The Rising Of The Palolo." In it the author, Tofa I'iga Pisa of Western Samoa, explained how a formula had been developed for predicting each year the date of the rising of the palolo, a reddish-brown, worm-like marine organism greatly prized as a delicacy in the islands around which it occurs.

For Fiji, the risings were predicted for dawn on November 19, and for Western Samoa, for dawn on October 19 and perhaps more on the following morning, with a possible further rising at dawn on November 18.

The accuracy of the prediction for Fiji has been confirmed by Mr. Rob Wright of Suva, a leading amateur fisherman and Editor of the "Hook, Line and Sinker" page of the *Fiji Times*. He writes: "You may be interested to know that the times worked out for the rising of the palolo in Fiji were 'bang on the nose'. The palolo rose in various parts of the Group at daylight on the Monday morning, November 19".

In Western Samoa, the newspaper *Samoana* for November 1 reported that there had been heavy risings of palolo on the north coast of Savai'i on October 18 and 19, with smaller quantities at the eastern and western ends of Upolu.

Health Education Courses In French Polynesia



Two new courses in health education were held recently in Tahiti, one for student teachers, the other for male and female trainee nurses. This account of the organization and conduct of the courses was prepared by . . .

BENJAMIN BAMBRIDGE and LILIANE GEISSELER*

At the Maternal and Child Health Centre, Papeete, an assistant teacher from the Tuamotu Islands tastes the baby food he has helped prepare in the kitchen where demonstrations are held.

THE health education courses that the South Pacific Commission has helped to organize so far in the various territories of the Pacific have as a general rule been intended for practising members of health and teaching staffs. Participants had already encountered various problems as a result of which some of them realized the advantages of an educational approach directed at both adults and children. These, therefore, were particularly receptive to the training given during the health education courses. On the other hand, others who had been working for many years along authoritarian lines, or who were convinced that their task stops at the door of the hospital or of the school, often found it difficult to change their viewpoints and habits during a compartively short course. This is one of the reasons why it is essential to provide follow-up activities.

Easily the best way is to start as early as possible to foster an interest in health education among health and teaching personnel, and to acquaint them right at the beginning of their careers, i.e. during their training, with certain ways of thinking and acting. Obviously this implies a need for reorganizing the curriculum as well as for competent staff to teach the principles and methods of health education. (Though as a matter of fact, these methods and principles are *not* specific to health education, but are generally common to other fields or community education such as agricultural extension and social development.)

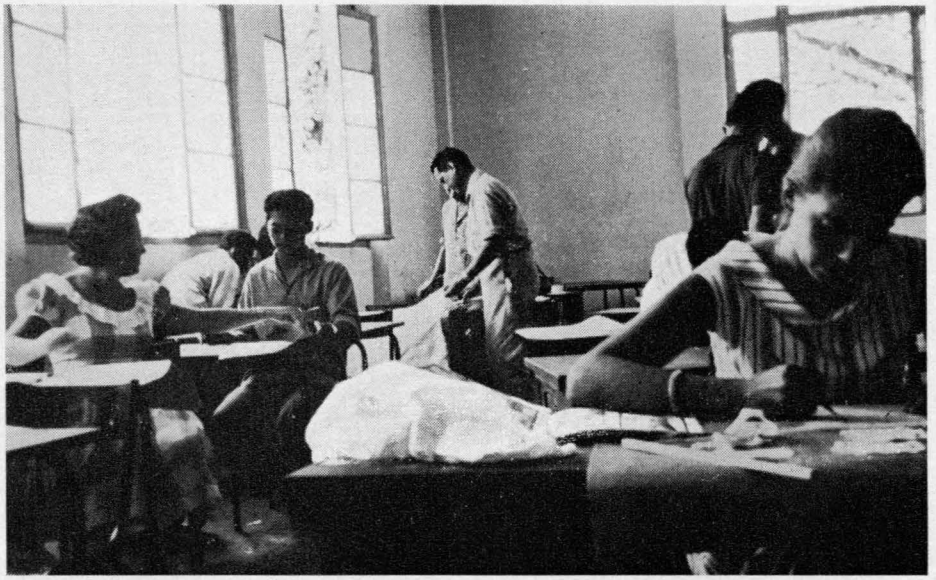
The two courses in health education which were held last August in Tahiti were given to students in training. The courses represented a first experiment, and will serve as pilot courses for the teaching of health education, which in the future, in French Polynesia, will be undertaken by local personnel and the territory's health educator.

First Course For Student Teachers

The first course, held from August 6-11 at the Collège Paul Gauguin, was attended by fourteen graduating teachers who were just completing the teachers' training course, and fifteen probationer teachers. The latter, who will work in remote islands of French Polynesia where there is no medical personnel, have also received some basic health training.

The school physician and the woman doctor in charge of the Maternal and Child Health Service gave them lectures to brush up and extend their knowledge in the subjects of personal and school health, epidemiology, and mother-and-baby care. However, the main emphasis was placed on the teacher's role within the community, and on the influence he can have to help the population improve their health.

On the last day, after the final evaluation of the course, the students gave demonstrations of the techniques they had learnt. In view of the limited amount of time available, they had been divided into teams of five or six members and assigned different subjects which they had to prepare while using visual aids and various educational methods. For example, one group gave



Teacher trainees making visual aids under the guidance of Mr. Bambridge.

* Mr. Benjamin Bambridge, Chief Inspector of the Institute of Medical Research of French Polynesia, is currently studying health education in Europe, and upon his return will take up the functions of health education officer for the territory. Miss Geisseler is SPC health education officer.

At a women's meeting where members are making "tifaifais" (sheets decorated with applique or patchwork), a nurse trainee takes advantage of the occasion to explain about children's inoculations.

a model lesson in personal hygiene to a class of ten-year-olds; another group talked to mothers about baby care, giving demonstrations; two other teams role-played the way in which the village teacher could participate in a meeting of parents discussing the establishment of a school canteen, and in the meeting of the officials of an island who were anxious to prevent the recurrence of a typhoid epidemic.

Although the subjects and methods of working were rather new to them, the students showed both initiative and creative spirit.

Second Course For Nurses

The second course, intended for male and female probationer nurses, took place from August 20 to 31. The twenty-three trainees were finishing their first year, and had already acquired a knowledge of public health, epidemiology and maternal and child health.

Theory was limited to elements of applied psychology and sociology; the students discussed how to communicate with individuals, families, and the various existing groups in the community, as well as the beliefs and attitudes which affect people's behaviour in health matters. But the main object was to stress the necessity of integrating health education in the daily activities of the nursing personnel in the wards, and out-patients clinics, during the consultations and through other activities in the community.

Trainees Given Field Work

To give the trainees confidence and help them overcome their shyness, which often prevents them from speaking in public, they were given the opportunity of practising in the field instead of staging demonstrations in the classroom. This also provided an experiment for ways of developing educational activities in the hospital without interfering with the general routine, and in the districts by selecting the "psychological moment" when the people are ready to listen and are therefore the most receptive.

As Tahitians are rather critical, it was necessary to produce good-quality visual aids and to prepare the presentations carefully. The students taking the teachers' course carried out the work in teams, dividing it among themselves according to their artistic or oratorical talents.

One group chose the waiting room of the Maternal and Child Health Centre to give a talk on pre-natal care to pregnant women. Another went to the tuberculosis ward of the hospital and, with a flannelgraph, explained to the patients the causes and consequences of their disease, and the treatment and preventive measures to be taken. Patients were asked questions and they replied with much enthusiasm, requesting more frequent meetings. A third group demonstrated infant care to new mothers in the Maternity Hospital, while a fourth group went to a district where the women have formed an Association and meet regularly to make, among other things, the renowned Tahitian *tifaifai*. Using a film, posters and a practical demonstration using a microscope to show bacteria compared with hair, the students explained the process of immunization and the programme which is being carried out in the territory, encouraging the mothers to let their children benefit from it.

The welcome received everywhere, and the encouraging response from the public, rewarded the students for their efforts. It is to be hoped that, in spite of the obstacles they will encounter, they will maintain health education activities in their work throughout their careers.

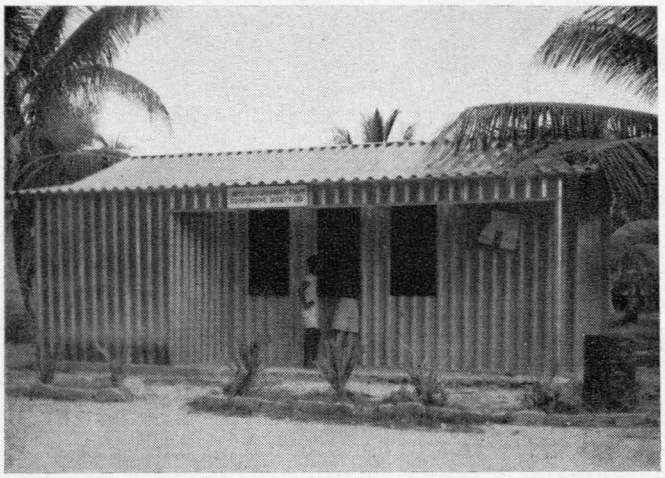
With their supervisor (left) and the woman doctor in charge of the Maternal and Child Welfare Centre (in background), student nurses leave the Centre where they have just been talking about pre-natal care to pregnant women waiting for consultation.

Museum And Library For Cook Islands

The people of the Cook Islands are working hard to raise money for a museum to house Polynesian artifacts and other exhibits, and a free lending and reference library. A site in Avarua, administrative centre of the Cook Islands, has been given for the museum library by Makea Nui Teremoana Ariki, C.B.E., a leading chieftainess of Rarotonga. Plans for a 5,000-square-foot building are being prepared by a New Zealand architect.

The library will have room for 2,000 reference books, and 4,500 books for borrowing. Storage space for a further 1,000 books will also be provided, and it will be possible for the library to be extended to hold another 3,000.

Copra Marketing In The Gilbert And Ellice Islands



This pre-fabricated aluminium store belongs to the Betio Government Officers' Co-operative Society. A steady rise in turnover recently made necessary the appointment of a full-time manager.

In the Gilbert and Ellice Islands, a system of co-operative copra marketing has been built up that gives the highest return to the many small producers on the isolated, widely-scattered islands of the Group, and as well ensures maximum production for the overall economic benefit of the Colony.

By H. R. R. L. COOPER*

COPRA marketing in the Gilbert and Ellice Islands involves a number of problems peculiar to the Colony, as well as the usual difficulties inherent in marketing a crop which has no seasonal harvest time but is produced throughout the year.

The importance of copra to the Colony cannot be over-emphasized, as, with the exception of the phosphate of lime which is mined at Ocean Island, it is the Colony's only export.

Apart from the two commercial plantations in the Line Islands, the Colony's copra is produced entirely by peasant proprietors and their families on the islands of the Gilbert, Ellice and Phoenix Groups. It is marketed through consumer-marketing co-operative societies established on every inhabited island in the three groups (with the exception of Sydney Island in the Phoenix Group, which now has no indigenous population and is worked as a plantation on producer co-operative lines by the Phoenix Islands Co-operative Society). The consumer-marketing societies buy all copra produced on their respective islands, grade, store and bag it for shipment to Tarawa, which is the main overseas loading port for the three groups.

Marketing Controlled By Board

Marketing is controlled by the Colony Copra Board, which purchases all copra for export produced in the Colony, and arranges through its agent for storage and eventual shipment overseas.

In the Gilbert, Ellice and Phoenix Groups, the Board employs the Gilbert and Ellice Islands Colony Wholesale Society as its agent. The Society is a trading corporation on the lines of the Ceylon Wholesale Establishment, established with the principal object of supplying and servicing the co-operative societies. It has its headquarters at Tarawa, the overseas loading port for the three groups. It operates two inter-island vessels, and as well provides stevedoring and lighterage facilities.

In the Line Islands, the commercial plantations store and ship their own copra on behalf of the Board.

The Board at present sells the entire exportable production of copra—amounting to some 6,000 tons a year from the Gilbert, Ellice and Phoenix Groups, and some 2,000 tons a year from the two commercial plantations — to Unilever (Raw Materials) Ltd. under a bulk purchase agreement at prices based on the ruling market price for Philippines copra at time of shipment.

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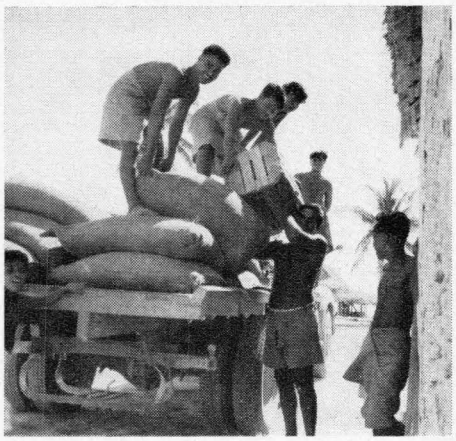
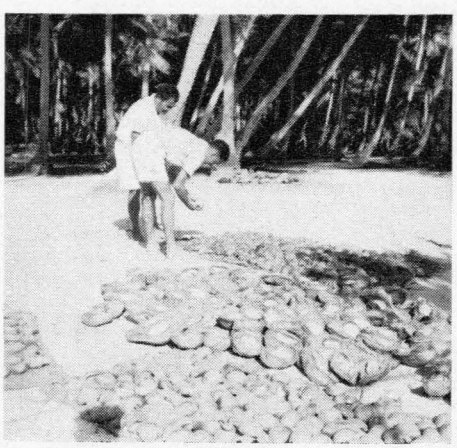
* Since preparing this article as Registrar of Co-operative Societies, Gilbert and Ellice Islands Colony, Mr. Cooper has accepted appointment as Deputy Registrar of Co-operatives, Fiji.

Below: Copra loaded by Kuria Co-operative Society members into a whaleboat is later swung aboard the "Moana Raoi", anchored offshore (right).



Stock for the retail stores on Abemama Island being unloaded from the local Co-operative Society's truck at the bulk store. The crate contains onions, a popular line.

Two of the main items sent to island stores are flour in 150 lb. bags, and brown sugar in 224 lb. bags. Men and women carry them from the surfboats.



The author inspects copra being sun-dried in the unhusked, half-nut state.

Agnes Muller of Kuria Island displays the £53/8/10 she obtained from her Co-operative for copra made in three weeks.

Transport A Major Difficulty

The major difficulty facing the Copra Board and the co-operative societies is one of geography. The mean distance between the islands of the Northern and Central Gilberts and the overseas loading port at Tarawa is 76 miles, between Tarawa and the Southern Gilberts, 256 miles, while between Tarawa and the islands of the Ellice and Phoenix Groups it increases to some 768 miles.

Shipping connections are provided by the two vessels owned by the Wholesale Society, M.V. "Moana Raoi" of some 200 tons capacity, and M.V. "Tungaru" of some 100 tons capacity, by two Colony Government vessels each of some 100 tons capacity and, in the Northern and Central Gilberts, by two auxiliary ketches, each of some 20 tons capacity, owned by two Co-operative Unions.

The nearer islands of the Northern and Central Gilberts are therefore fairly well served by shipping connections with Tarawa, but in the Southern Gilberts and in the Ellice and Phoenix Islands shipping connections are fewer. In the Southern Gilberts a Co-operative Society on average is able to ship copra to Tarawa only once every two months, in the Ellice Group once every three months, while in the Phoenix Group ships call at approximately four-monthly intervals.

Co-operative Stores Purchase Copra

The co-operative societies maintain copra-buying points at all their stores, and a member or copra producer is able to sell his copra for cash to the society at any time during the working day. On no island does a copra producer have to take his copra more than three miles to sell it, while on some islands the co-operative society will collect members' copra by truck either from their houses where the copra is dried or from their land.

The societies buy copra by the pound, and parcels as small as five, ten or fifteen pounds are commonly purchased. The Copra Board provides copra sacks and twine, so that the producer has no expenses to meet once he has sold his copra to the co-operative society.

It does, however, follow that a co-operative society, particularly on a more distant island, may be called upon to finance quite considerable purchases of copra between shipments to Tarawa, as well as to carry sufficient stocks of merchandise—in particular, lines in general demand such as rice, flour and tobacco—if the economic activity of the island is to be kept going, and copra production maintained.

Financing Of Copra Purchases

In the past, co-operative societies were able to obtain very liberal credit facilities from the Wholesale Society with which to finance both their copra-purchasing operations and their retail merchandise trading. In turn, the Wholesale Society was able to obtain advances from the United Kingdom Ministry of Food against copra held in store at the port of Tarawa.

The termination of the bulk purchase agreement with the Ministry of Food in 1957 coincided with the effects of a very serious drought in 1956, which caused a severe restriction in both credit and volume of turnover. It was found that many co-operative societies had, by poor business management and unwise investment, dissipated a very considerable proportion of their reserves which constituted the major portion of their working capital.

Before recovery could be effected, however, the drought ended and production increased rapidly. The price also increased, and societies found themselves forced to finance very considerable purchases of copra at the higher prices as well as to finance an increased volume of merchandise turnover.

Wholesale Society credit was no longer available, and it fell to the Copra Board to find some measure by which it could assist co-operative societies to finance copra purchases and, by relieving them of this burden, allow them to concentrate their resources on financing their merchandise trading and so maintain a supply of incentive goods to keep copra production at a high level.

During the years of the bulk purchase agreement with the United Kingdom, the Copra Board had built up considerable reserves for both price stabilization and copra industry development by deducting a portion of the price received from the Ministry of Food (except in the case of copra produced by the commercial plantations in the Line Islands, which operated independently of the marketing arrangements for the rest of the Colony).

Bulk Purchase Agreement In 1958

In 1958 the Board concluded a bulk purchase agreement with Unilever (Raw Materials) Ltd. for the sale of all the Colony's exportable copra, and was able to finance the purchase of the crop in the Gilbert, Ellice and Phoenix Islands District, by utilising a portion of its reserves and thereby avoiding the necessity for borrowing capital and the consequent payment of interest.

In 1959 it was also able to institute a system of Copra Purchase Advances to assist co-operative societies to finance the purchase of copra on their respective islands, so that their available capital could then be used for merchandise trading.

Under the Copra Purchase Advance system, the average monthly purchases of each consumer-marketing society are calculated and the average period of time between shipments of copra to Tarawa is worked out. Each society's Copra Purchase Advance is then calculated at the ruling price, and the Wholesale Society is authorized to credit the society's current account with the amount of the advance which the society can draw in either cash or goods. Thus the society can obtain an advance to cover the amount of copra which it would normally carry in stock between shipments.

The rate of average monthly purchases is reviewed quarterly, as is the shipping position from time to time, so that the advances can be adjusted in the light of current production and shipping availability. Advances are also reviewed automatically when prices alter.

When the system was first instituted, amounts advanced were quite considerable. Prices were high in 1959, and many societies had not recovered from the effects of the drought and were very short of trading capital.

This shortage resulted in an acute scarcity of cash on many islands, with the result that societies were compelled to resort to a number of subterfuges ranging from outright barter of goods for copra to complicated and unworkable personal accounting systems whereby a member would be credited for copra at one branch and buy goods on credit, often at another branch. The result was that, in the great majority of cases, when the final reckoning was made the member was almost always found to be in debt to the society.

Other societies took to issuing credit slips for the amount of copra weighed in by members, which were redeemable for cash or goods at a later date. Inevitably these slips got into circulation on the islands as a form of currency, which caused further dislocation.

The institution of Copra Purchase Advances, however, enabled currency to be

sent to islands, and allowed societies to revert to normal cash trading.

With the recovery of many societies in the 1959-60 financial year due to the high prices of copra, it has been possible to reduce the amount of Copra Purchase Advances granted to them. In accordance with the policy of making all societies financially independent of outside credit, from whatever source, they are encouraged to accumulate adequate capital resources by the transfer of profits to reserves, and to dispense with Copra Board assistance whenever possible.

Although the Copra Board does not make any interest charges for advances, it nevertheless imposes certain restrictions on the societies concerned, in particular by the control of capital expenditure on store buildings and major items of equipment.

Producer Prices

Producer prices have been fixed by the Copra Board for all islands in the Gilbert, Ellice and Phoenix District. Ever since the inception of the present system in 1945, a "standard price" policy for both merchandise and copra has operated in respect of these areas. Under this policy, retail prices for merchandise and producer prices for copra have been the same on all islands, irrespective of their distance from the overseas loading port of Tarawa. In effect, the nearer islands subsidize those more distant, and freight rates are averaged accordingly.

The Board fixed the producer price after estimating the probable price received from Unilever (Raw Materials) Ltd. and deducting therefrom its necessary expenses, i.e. freight both within the Colony and overseas, handling charges incurred by its agents at Tarawa (the Wholesale Society) and by the co-operative societies on their respective islands, export duty, and insurance charges.

Both the Wholesale Society and the co-operative societies work on a fixed figure for handling, with the exception that no margin for profit is allowed to the Wholesale Society, which instead receives a fixed commission. This "price breakdown", as it is called, is published locally by the Board in the vernacular newspapers and over the radio.

Because the co-operative societies often purchase copra in small parcels of only a few pounds weight, it has been found convenient to express the producer price in pence per pound, and, for ease of calculation, prices are expressed to the nearest farthing.

Price Alterations

Due to the fact that it possesses ample reserve funds, the Copra Board is able to avoid frequent alterations in price, particularly on a falling world market. This has a very considerable advantage for the consumer-marketing societies, for al-

though every inhabited island is in daily radio communication with Tarawa, frequent alterations in price would greatly increase the difficulties of societies with isolated buying points. In January, 1961, however, faced with a steadily falling world price, the Board was obliged to drop producer prices by 1d per pound. Despite this action, during the financial year 1960-61, when the estimated f.o.b. price was not realized, the Board nevertheless finally subsidized all copra produced in the Gilbert, Ellice and Phoenix District by £9.14.6d per ton. This large subsidy offset to a great extent the surpluses which the Board had made on a rising market in previous years.

In March, 1961, the Board again had to reduce prices by ½d per pound. Despite considerable savings in Wholesale Society Agency expenses, a reduction of £1 per ton in the margin paid to co-operative societies and a reduction in the Wholesale Society Agency commission, the Board is paying a subsidy of between £5 and £6 per ton at present world market prices. Fortunately, if the world market does not improve, the Board's reserves are in a position to meet this subsidy for some time to come.

Copra Quality And Grading

Practically all the Colony's copra is sun-dried, due to the relatively low rainfall on the majority of islands. Only in the Northern Gilberts and in the Ellice Islands is rainfall sufficiently high to interfere seriously with sun-drying. On these islands several experiments have been made with "Kukum" hot air driers.

A copra-quality improvement programme was started by the Co-operative Department in conjunction with the Copra Board in 1957. At that time, of all copra received at Tarawa for export, only 17% was of first-grade quality, 58% was of second grade, and 25% of third grade. By March, 1961, no third-grade copra was being produced, and 83% of all copra received at Tarawa was of first-grade quality. First-grade copra is made from half-nuts, well dried, and free from mould or insect damage.

Chemical analysis of 1960 exports on arrival in the United Kingdom showed an oil content of 66.58%, an F.F.A. content of 1.84%, a moisture content of 3.4%, and .26% of dust and chips.

Copra is graded by the Co-operative Society staff on purchase from the producer, and the grading is checked by a Copra Inspector before the copra is shipped to Tarawa. On arrival at Tarawa, spot checks are made by the Senior Inspector, who also tests moisture content by meter.

Although there has been a remarkable advance in the quality of the Colony's copra over the past four years, there is

still very considerable room for improvement, particularly in the methods used for drying and storing copra.

Conclusion

The present system of copra marketing through the consumer-marketing co-operative societies appears to offer the producer on the isolated and scattered islands of the Gilbert, Ellice and Phoenix Groups the best possible return for his product. Thanks to its careful accumulation of reserves during the past, the Colony Copra Board is able to maintain a relatively stable price within the Colony, which is of great advantage to both the producer and to his co-operative society.

Although the producer price may at first sight appear low, it nevertheless represents a nett return to the producer who does not have to bear any shipping expenses, and who can sell his copra for cash at any time during the working day, as soon as drying is complete, in any quantity from a pound to a ton.

Also, when comparisons are being made with other territories it should be remembered that due to the Colony's isolation, freight rates—both within the Colony and overseas—are considerably higher than in most other areas of the Pacific. The need to levy export duty, which underlines the importance of copra to the Colony, should also be taken into consideration.

Although the Board continues to specify a producer price in pence per pound for copra, this has become a minimum figure. Efficient co-operative societies are able to pass any saving made in their margin direct to the producer in the form of an increase in producer price in their particular area of operations.

This arrangement also allows the Board to pass on to the co-operative societies the benefits of an increase in the world market price, where the amount involved is less than one farthing per pound, which might either enable a marginal society to increase its producer price within its area of operations or allow it to pass on the increase to members by way of bonus at the end of the year.

The close association between the Copra Board and the co-operative societies, underlined by the financial assistance that the Board has provided to the co-operative movement by the provision of the salaries for both the Assistant Registrar and the Accountant in the Co-operative Department, has enabled a system of co-operative copra marketing to be built up which gives the maximum return to the many small producers on the scattered islands of the Gilbert and Ellice Groups, as well as ensuring maximum production for the overall economic benefit of the Colony.

PACIFIC READING

Material in this section is contributed by the South Pacific Commission Literature Bureau. Any enquiries relating thereto should be directed to BOX 5254, G.P.O., SYDNEY, AUSTRALIA.

Literature Bureau Publications

WOMEN'S CLUB ACTIVITY BOOK. Stocks of the publication *Things to Learn in Women's Clubs,* referred to in the January, 1962, "Notes and News", are now available from the Literature Bureau. Attractively produced in two colours, this 92-page book is a collection of ideas and educational activities intended to guide and assist the club leaders in planning more interesting and practical club programmes for their members.

The material has been compiled from various sources by Miss Marjorie Stewart, and includes a wide range of information on such topics as: (i) How to Run a Meeting; (ii) How to Make a Comfortable Home; (iii) How to Make Things for the Home; (iv) How to Cook for the Family; (v) How to Wash for the Family; (vi) How to Keep the Family Healthy; (vii) How to Deal with Accidents; (viii) How to Bathe and Feed the Baby; (ix) How to Enjoy Recreation. Each chapter is illustrated with clear line drawings.

In view of the dearth of suitable material for Pacific Islands conditions we feel sure that club leaders, and those organizers in areas where women's clubs are being fostered, will find this book a most valuable guide.

Enquiries concerning this book should be made to the Literature Bureau, Box 5254, G.P.O., Sydney, Australia. The price for single copies is A.3/- plus postage, a discount being granted on orders for twelve or more copies.

THE PACIFIC ISLANDS TODAY. Owing to an unexpectedly large demand the first printing of the English edition of this book was completely sold out shortly after publication. A second impression incorporating some minor revisions has now been completed, and copies are available again from the Literature Bureau. The price for single copies is A.5/-, a discount being granted on all orders for twelve or more copies.

Reprints—Bureau Publications

In response to many requests the Bureau has also arranged the reprinting of the following previously out-of-stock publications:

HANDBOOK FOR WOMEN'S CLUBS AND ORGANIZATIONS (price A.1/- per copy).

A small handbook prepared for the guidance of club leaders and others engaged in women's club work.

FLIES ARE YOUR ENEMY (price A.1/- per copy).

The dangers of fly-infested villages, and the benefits that result from ridding such villages of flies, told in simple story form.

A GAME OF GOOD HEALTH (price A.1/- per copy).

A game based on the 'snakes and ladders' principle, designed to teach the basic rules of good health at village level.

IDEAS FOR SOUTH PACIFIC KITCHENS (price A.1/- per copy).

A simple but practical guide to kitchen improvement for use at village level. Based on material prepared at the SPC Women's Interests Seminar, 1961.

Copies of these publications are now available from the Literature Bureau, Box 5254, G.P.O., Sydney, Australia, at the prices indicated, plus postage. Discounts are

granted on orders for twelve or more copies received from training institutions, missions, schools, etc.

Books About the Pacific

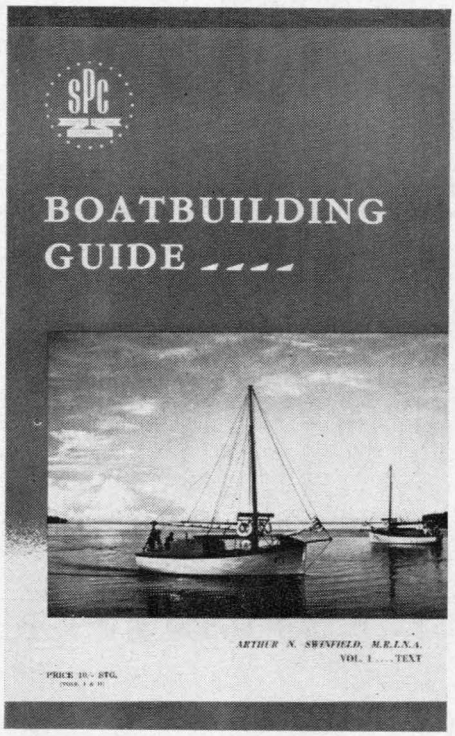
TWO HUNDRED CHANGING YEARS. M. Crocombe. Wellington: Islands Education Division, Department of Education. 1962. pp. 51.

The story of the Cook Islands, Niue, and the Tokelau Islands, by a Cook Islander. This book is recommended without reserve. Its authenticity stems from the author's own careful research and personal connexion with the islands, aided by the supreme advantage of being able to read old documents in the island language. The appropriateness of its language level to the reading needs of island schools is a product of her experiences as a teacher in the islands and the 'viewpoint' is that of the islander. The style is neither forced nor self-conscious and indeed is hard to pin down; yet somehow it gives a different and entirely welcome flavour to the story.

The production is the usual high standard we have come to expect of the Islands Education Division. This is a most useful addition to social studies material, whether for island schools or for schools in the metropolitan countries bordering the Pacific. Enquiries for copies should be made to Officer for Islands Education, Islands Education Office, Wellington, New Zealand.

Miscellaneous

LITERATURE BUREAU LIBRARY. For a number of reasons the book reviews in these columns are usually confined to books directly concerned with the Pacific. However, the Bureau receives specimen copies of many books from publishers which, while not about the Pacific, might well be useful in Pacific Island schools and libraries, etc. These books are placed in the library of the Bureau's offices in Sydney, and for many years visitors from the islands have found this a useful centre where they can find out "what's new" and examine books at leisure. Island educationists and others are cordially invited to continue to make use of these facilities.



The SPC BOATBUILDING GUIDE was prepared by Mr. Arthur N. Swinfield, M.R.I.N.A., a leading Australian naval architect, as the instruction manual for the SPC Boatbuilding Course recently concluded at Auki.

In two volumes—one of text and the other of diagrams—it is written in a simple and clear style, and with easy-to-follow diagrams.

The SPC BOATBUILDING GUIDE may be purchased for 10/- stg. (Vols. I and II), post free by surface mail, from—

THE SOUTH PACIFIC COMMISSION,
G.P.O. BOX 5254, SYDNEY, AUSTRALIA.

Oceanographic Research In The Pacific

(Continued from page 30)

financing and building of a new boat, with funds allocated to assist scientific research.

In 1961, 2,600,000 N.F.[2] were released for this purpose, and administrative procedure for the design of the new vessel and the placing of an order for her construction was commenced. The administrative stage is now over, and the "Ateliers et Chantiers de la Manche" at Dieppe have been officially requested to build a ship 125′ long, with a beam of 27′, displacing 470 tons, for French marine research in the Pacific.

She will include cabins for twelve research workers and technicians over and above the normal crew members, and will enable sampling with light gear to the greatest depths, and with heavy or medium equipment down to a few hundred feet, to be carried out.

[2] £1stg. = 13.60 NF.

This will not be a large oceanographic ship of world importance, but our possibilities will be greatly increased, both quantitatively and qualitatively.

We mentioned above a few extra tasks which were undertaken in 1962 as trials. This was done mostly to define the problems involved. In reality they are only a part of the possibilities which will be added to the current research work, but nevertheless remaining within the general list defined at the beginning of this article. In addition, we shall be in a position to carry out, on request, different types of work such as bathymetric and also geological and geophysical research.

Also, the physical range of this future programme will be quite different from that possible with *Orsom III*; in fact, it could well be defined as covering the whole South Pacific Commission area.

Conclusion

In conclusion, the French oceanographic programme already carried out has contributed appreciably to the knowledge of waters in the north-east area of the Coral Sea. It has been acknowledged as performing a substantial rôle in the field of international research, particularly through co-operation at sea and in the laboratory with Australian and American research workers. Now, with its increased means, it will encompass not only the whole of the Melanesian area, but also the Polynesian area.

At the time when industrialized fisheries are rapidly developing in our area, the basic knowledge of the sea around us, which is a major element in the life of various groups of islands, will have more and more practical applications. Unfortunately, scientific progress is never-ending; new developments already need to be put to local use, and where there is no organisation to do so, one will have to be established. This is an essential condition if our co-operation with local fisheries departments is to be effective and precise.

Western Samoa Society Of Accountants

By R. H. BOYAN

IN Western Samoa, accountancy students seeking a diploma from the Western Samoa Society of Accountants are now in their third year of study. The institution of Samoan professional examinations in accounting is of special interest, because other Pacific territories may follow a similar course.

Moves to introduce local examinations were initiated early in 1959, arising out of a recognition of the lack of qualified accountants in Western Samoa and the difficulties and disadvantages of seeking an overseas qualification. The first steps were encouraged by both Government and commerce.

Promotion Committee Set Up

In April 1959 a Promotion Committee was elected to investigate the possibility of forming a local society, and to prepare a syllabus of examination. The Western Samoa Society of Accountants was later formed, receiving a Certificate of Incorporation dated November 4, 1959.

During 1959 the Promotion Committee worked on the preparation of a suitable syllabus, bearing in mind special needs of Western Samoa. The final subjects approved were:

1. Accounting Stage I
2. Commercial Practice Stage I
3. Accounting Stage II
4. Commercial Practice Stage II
5. Accounting Stage III
6. Mercantile Law
7. Auditing
8. Company Law and Practice
   or Public Administration.

The Government of Western Samoa gave approval in principle to the proposals, and followed this up with a provision of £400 in the Estimates for 1960. General control for lectures, etc., was handed to the Department of Education, which maintains close relations with the Society.

In 1960, instruction was offered in the first two subjects, in 1961 in the first four, and in 1962 in the first six. Applications have exceeded the number of students that can be handled, and this has partly been overcome by allowing studies in one instead of two subjects during a year. In 1960, 62 students were selected for the first two subjects. For 1962 the Society received applications from 82 students covering six subjects, with total class enrolments of 157.

Widespread Support For Venture

Support for the venture has been widespread. The students have been addressed by His Highness Tupua Tamasese, C.B.E., and His Excellency the New Zealand High Commissioner, Mr. J. B. Wright. Donations of books have been made, prizes given, and the New Zealand Government through their Educational Aid Programme has subsidized the salary of a seconded teacher to assist with the lecturing.

The first fruits of all that has been devoted to the venture will be the presentation of diplomas to a number of successful students at the end of 1963.

French Polynesia

(Continued from page 46)

mately 85,000,000 frs. CFP came from grants and loans from metropolitan France. In addition the French State, which assumes direct responsibility for the cost of some administrative services in the territory, spent approximately 600,000,000 frs. CFP in Polynesia during 1961. During that year the territory received, in return for its investments, nearly 121,000,000 frs. CFP from the FIDES.[3] From 1947 to 1960, French Polynesia had already received from FIDES over 1,200,000,000 frs. CFP to carry out its first two development plans.

FIDES will contribute to the extent of 1,265,000,000 frs. CFP to the third five-year plan now being implemented. Further, French Polynesia is now benefiting by grants from the European Development Fund established for overseas territories by the European Economic Community.

* * *

The population of French Polynesia, which was 26,000 in 1911, grew to 80,000 in 1961, and it is fully anticipated that it will continue to expand. This increase in population should result in corresponding economic development, but especially because of the drop in world prices, the traditional agricultural production cannot be relied upon, because it remains stationary. The mining of phosphate at Makatea, which brings into the territorial budget approximately 25% of its income, and which contributes largely to the economy of the territory, will cease in six or seven years through exhaustion of the deposits.

Thus the new tourist industry is a timely development. Already it has assumed an important rôle in the economy of the territory. Its full development, now in progress, should be completed within a few years.

[3] FIDES—*Fonds de Développement Economique et Social* (Fund for Economic and Social Development)—was established in 1946 by France to provide financial aid for its Oversea Territories.

SOUTH PACIFIC BULLETIN

Index of Articles, by Subject and Author, published during 1962 (Vol. 12 No. 1-4)

Subject Index

Author Index

Subject Index

Author Index

Air Service Between Suva And Tarawa Planned

Fiji Airways is planning to start a fortnightly air service between Fiji and the Gilbert and Ellice Islands this year. A Heron aircraft will fly between Suva and Tarawa, with a stop for refuelling at Funafuti, in the southern part of Ellice Islands, where there is a wartime airstrip. The service may be extended to Nauru, where there is already an airfield and radio navigational facilities, and to Ocean Island, where the possibility of building an airstrip is now being investigated.

Linguistics Expert In Noumea

Mr. A. G. Haudricourt of the *Centre National de la Recherche Scientifique* (National Centre for Scientific Research), Paris, is at present visiting Commission headquarters. As a follow-up to a three-month visit in 1959, he proposes to spend eight months in New Caledonia studying vocabularies of local dialects.

SPC Entomologist Completes Beetle Study

Dr. Charles Hoyt, the Commission's entomologist, returned to headquarters late in November after completing a four-month study of the factors influencing the populations of rhinoceros beetles in Papua and New Guinea. The investigation was undertaken to prepare for the extensive search for biological control agents of *Oryctes rhinoceros* in the South-East Asia area which will begin shortly.

South Pacific Commission Technical Papers

Copies of SPC Technical Papers, which as a general rule are published both in English and French editions, may be procured from the South Pacific Commission, Nouméa, New Caledonia, or G.P.O. Box 5254, Sydney, Australia. Except where otherwise stated, price per copy, post free by surface mail, is 2/- stg. (2/6 Aust., 2/3 Fijian, 30 cents U.S., 1 New Guinea guilder)*. The letters "E", "F", or "EF" in parenthesis at the end of each listing indicate present availability of titles in English and/or French editions.

NUTRITION

23. **Nutrition Research Conducted in New Hebrides during 1951.** Sheila Malcolm. April 1952. (E).
50. **Nutrition Investigation in New Caledonia.** Sheila Malcolm. October 1953. (E).
63. **Diet and Nutrition in American Samoa.** Sheila Malcolm. August 1954. (E).
83. **Diet and Nutrition in the Trust Territory of the Pacific Islands.** Sheila Malcolm. July 1955. (E).
95. **Bibliography of the Nutritional Aspects of the Coconut.** F. E. Peters. September 1956. (EF).
100. **Chemical Composition of South Pacific Foods—An Annotated Bibliography.** F. E. Peters. January 1957. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
106. **Some Food Problems in the Pacific Islands.** H. S. McKee. May 1957. (EF).
113. **The Diet of Mothers and Children on the Island of Guam.** Sheila Malcolm. January 1958. (EF).
115. **The Chemical Composition of South Pacific Foods.** F. E. Peters. February 1958. (EF).
118. **Nutrition and the Papuan Child.** H. A. P. C. Oomen and S. H. Malcolm. April 1958. (8/- stg., 10/-A., 9/-F., $1.20, 4G.). (EF).

PUBLIC HEALTH

12. **Tuberculosis Investigations by the South Pacific Commission in 1950.** May 1951. (EF).
24. **A Survey of Leprosy on the Island of Nauru.** Dr. C. J. Austin. April 1952. (EF).
27. **A Survey of Leprosy in the British Solomon Islands Protectorate.** Dr. C. J. Austin. July 1952. (EF).
56. **Leprosy in Netherlands New Guinea.** Dr. Norman R. Sloan. April 1954. (EF).
62. **Leprosy in American Samoa.** Dr. Norman R. Sloan. July 1954. (E).
64. **Dental Conditions in School Children of American Samoa.** Dr. Raymond G. Neubarth. August 1954. (E).
67. **Ophthalmological Survey of the Trust Territory.** Dr. H. E. Crawford. September 1954. (E).
69. **Leprosy in Western Samoa and the Cook Islands.** Dr. Norman R. Sloan. October 1954. (E).
96. **Health Education in the South Pacific.** G. Loison and L. L. Keyes. November 1956. (EF).
131. **Dental Health in South Pacific Territories.** P. B. Cadell. August 1960. (EF).

MOSQUITO-BORNE DISEASES

17. **Conference of Experts on Filariasis and Elephantiasis, Tahiti: Summary of Proceedings.** September 1951. (EF).
33. **A Survey of Malaria in the British Solomon Islands Protectorate.** Dr. R. H. Black, November 1952. (EF).
60. **Some Aspects of Malaria in the New Hebrides.** Dr. R. H. Black. May 1954. (EF).
61. **Malaria in the Trobriand Islands.** Dr. R. H. Black. May 1954. (E).
65. **Annotated Bibliography of Filariasis and Elephantiasis.** September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.). (EF).
66. **Distribution of Filariasis in the South Pacific Region.** Dr. M. O. T. Iyengar. September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.). (EF).
68. **Malaria in the Torres Straits Islands.** M. Josephine Mackerras and Dorothea F. Sanders. October 1954. (E).
80. **Malaria Control and Research in Netherlands New Guinea.** Dr. R. H. Black. March 1955. (E).
81. **Malaria in the South-West Pacific.** Dr. R. H. Black. March 1955. (EF).
86. **Distribution of Mosquitoes in the South Pacific Region.** Dr. M. O. T. Iyengar. 1955. (8/- stg., 10/-A., 9/-F., $1.20, 4G.). (EF).
88. **Annotated Bibliography of Filariasis and Elephantiasis.** Part 2. Dr. M. O. T. Iyengar. January 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
104. **Developmental Stages of Filariae in Mosquitoes.** Dr. M. O. T. Iyengar. May 1957. (EF).
105. **An Investigation on Filariasis in the Berau Region.** H. de Rook. May 1957. (EF).
109. **Annotated Bibliography of Filariasis and Elephantiasis.** Part 3. Dr. M. O. T. Iyengar. July 1957. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
110. **Enquete epidemiologique et entomologique sur la Filariose de Bancroft en Nouvelle-Caledonie et dependances.** M. Lacour et J. Rageau. (With Summary in English.) August 1957. (F).
119. **Enquete entomologique sur le Paludisme aux Nouvelle-Hebrides.** Jean Rageau et Guy Vervent. Janvier 1959. (Available in French only.) (F).
124. **Annotated Bibliography of Filariasis and Elephantiasis.** Part 4. Treatment. Dr. M. O. T. Iyengar. August 1959. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (E).
125. **Studies on the Epidemiology of Filariasis on Central and South Pacific Islands.** Elon E. Byrd and Lyle S. St. Amant. September 1959. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
126. **A Review of the Literature on the Distribution and Epidemiology of Filariasis in the South Pacific Region.** Dr. M. O. T. Iyengar. October 1959. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (E).
129. **Annotated Bibliography of Filariasis and Elephantiasis.** Part 5. Dr. M. O. T. Iyengar. June 1960. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (E).
130. **A Review of the Mosquito Fauna of the South Pacific.** Dr. M. O. T. Iyengar. July 1960. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (E).
132. **Summary Data on Filariasis in the Pacific.** Dr. M. O. T. Iyengar. August 1960. (EF).

TROPICAL CROPS

31. **Cocoa Plantation Management in Western Samoa.** D. R. A. Eden and W. L. Edwards. October 1952. (EF).
37. **Cocoa Growing in Netherlands New Guinea.** D. H. Urquhart. January 1953. (EF).
38. **Coffee Growing in New Caledonia.** D. H. Urquhart. January 1953. (E).
40. **Cocoa Growing in New Hebrides.** D. H. Urquhart. January 1953. (E).
82. **The Manufacture of Copra in the Pacific Islands.** W. V. D. Pieris. July 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
87. **L'agriculture vivriere autochtone de la Nouvelle-Caledonie.** Jacques Barrau et Jean Guiart. Janvier 1956. (Available in French only.) (20/- stg.) (F).
97. **Rice Production in the South Pacific Region.** R. Watson. October 1956. (EF).

PESTS AND DISEASES OF PLANTS AND ANIMALS

8. **Insect Pests in the Wallis Islands and Futuna.** F. Cohic. December 1950. (EF).
9. **Report of Plant and Animal Quarantine Conference, Suva.** April 1951. (EF).
34. **Rhinoceros Beetle Control in the Kingdom of Tonga.** L. J. Dumbleton. November 1952. (E).
77. **A List of Diseases and Parasites of Animals Recorded in the South Pacific Territories.** L. J. Dumbleton. December 1954. (EF).
78. **A List of Plant Diseases Recorded in South Pacific Territories.** L. J. Dumbleton. December 1954. (EF).
79. **A List of Insect Pests Recorded in South Pacific Territories.** L. J. Dumbleton. August 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G). (EF).
101. **Parasites and Predators Introduced into the Pacific Islands for the Biological Control of Insects and Other Pests.** L. J. Dumbleton. March 1957. (EF).
107. **The Rhinoceros Beetle in Western Samoa.** R. A. Cumber. June 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G). (EF).
116. **Contribution a l'etude des cochenilles d'interet economique de Nouvelle-Caledonie et dependances.** F. Cohic. Fevrier 1958. (Available in French only.) (F).
128. **Diseases and Biological Control in Rhinoceros Beetles.** Paul Surany. March 1960. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (E).

*** Abbreviations used in the above list for the currencies quoted are: stg. (sterling); A (Australian); F (Fijian); $ (United States dollars); G. (New Guinea guilders).**

ECONOMIC CONDITIONS

54. **The Pacific Islander and Modern Commerce.** V. D. Stace. March 1954. (EF).
89. **Small-Scale Industry for the South Pacific—Preliminary Papers.** Cyril S. Belshaw. March 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.). (EF).
90. **Industrial Activity in Selected Areas of the South Pacific.** K. H. Danks. March 1956. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.). (EF).
92. **Economic Aspects of the Coconut Industry in the South Pacific.** E. J. E. Lefort. September 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.). (EF).

CURRENT RESEARCH

29. **Current Research in the South Pacific in the Field of Economic Development.** July 1952. (E).
102. **Index of Social Science Research Theses on the South Pacific.** April 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G). (EF).
135. **Social Science Research in the Pacific Islands.** (Revised edition of T.P. 127.) June 1961 (E).

CO-OPERATIVES

42. **The Co-operative Movement in Papua and New Guinea.** Prepared by the Registry of Co-operative Societies, Port Moresby. February 1953. (EF).
120. **A Guide to the Marketing of Copra in Primary Co-operative Societies.** C. G. Joannides. January 1959. (EF).
121. **Catalogue of the S.P.C. Co-operative Library.** January 1959. (Revised edition of T.P. 75.) (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.). (EF).
123. **Co-operatives in the South Pacific.** (Report of the SPC Technical Meeting on Co-operatives held at Port Moresby July 21-August 1, 1958.) February 1959. (EF).

COMMUNITY DEVELOPMENT

74. **Educational Aspects of Community Development.** R. Thomson. January 1955. (4/- stg., 5/-A., 4/6F., $0.60, 2G.). (EF).
84. **The Communities Project Approach to Economic Development.** H. Belshaw. July 1955. (EF).
137. **Urbanization in the South Pacific.** Report of first meeting of SPC Urbanization Advisory Committee held Sept. 4-9, 1961. August 1962.

EDUCATION

3. **The Village Library.** April 1950. (EF).
14. **Educational Broadcasts to Samoan Village Schools.** Department of Education, Western Samoa. May 1951. (EF).
15. **Libraries for Beginners.** Dr. and Mrs. Kenneth Todd, Kwato Mission, Eastern Papua. July 1951. (EF).
32. **Types of Organization in Adult and Mass Literacy Work.** D. B. Roberts. August 1952. (EF).
47. **Central Vocational Training Institution.** F. J. Harlow. August 1953. 5/- stg.; plans available sep. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.). (EF).
73. **Educational Evaluation—A Documentary Survey.** J. C. Nield. December 1954. (EF).
99. **Education in the Pacific Islands—A Selected Bibliography.** C. Wedgwood. November 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.). (EF).
114. **An Experimental Course in Adult Literacy.** Karel Neijs. January 1958. (EF).
133. **Education Seminar for the South Pacific.** (Report of the SPC Education Seminar held at Brisbane, Queensland, Australia, November 16-27, 1959.) December 1960. (EF).

OTHER SUBJECTS

6. **A Preliminary List of Economic Plants of New Caledonia.** J. Barrau. July 1950. (EF).
25. **Report of Fisheries Conference, Noumea.** May 1952. (EF).
30. **Bibliography of Cargo Cults and Other Nativistic Movements in the South Pacific.** Ida Leeson. July 1952. (EF).
41. **Social Problems of Non-Maori Polynesians in New Zealand.** Rev. R. L. Challis. February 1953. (EF).
103. **How to Make Your Own Posters.** Nancy Phelan. May 1957. (2/6 stg., 3/3A., 2/9F., $0.40, 1.25G.). (EF).
108. **Practical Aspects of Weed-Killing by Chemicals in Tropical Crops.** E. J. E. Lefort. July 1957. (EF).
111. **A Selected Annotated Bibliography of Trochus.** R. Gail and L. Devambez. January 1958. (2/6 stg., 3/3A., 2/9F., $0.40, 1.25G.). (EF).
112. **Film and Filmstrip Catalogue.** (Revised edition of T.P. 71). January 1958. (3/- stg., 3/9A., 3/6F., $0.45, 1.50G.). (EF).
122. **Social Development in the South Pacific.** (Report of the Ninth Research Council Meeting.) February 1959. (EF).
134. **Trolling and Longlining for Tuna.** Two Papers by M. Angot and R. Criou. June 1961. (4/-stg., 5/-A., 4/6F., $0.60, 2G.). (E).
136. **A Linguistic Survey of the South-Western Pacific.** (New and Revised Edition). Dr. A. Capell. January 1962. (20/- stg., 25/-A., 22/6F., $3.00, 10G.). (E).

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TECHNICAL PAPERS: See list above.

OFFICIAL RECORDS: Proceedings of Sessions of the South Pacific Commission (First to Twenty-second); *Annual Reports of the South Pacific Commission (1948 to 1960); Reports of the First, Second, Third and Fourth South Pacific Conferences.*

EXPERT REPORTS: The Oxford University Press is publishing a series of Expert Reports in book form for the Commission. Five have been issued to date:

VOCATIONAL TRAINING IN THE SOUTH PACIFIC. By R. A. Derrick, M.B.E., A.M.I.S.E., F.R.G.S.
Price in Australia ..... *30/-A.*

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SOCIAL ANTHROPOLOGY IN MELANESIA: A Review of Research by Dr. A. P. Elkin, Professor of Anthropology in the University of Sydney. In this report Dr. Elkin reviews past, present and future anthropological research in Melanesia, designed to advance native welfare.
Price in Australia ..... *27/6A.*

SOCIAL ANTHROPOLOGY IN POLNESIA: A Review of Research by Dr. Felix M. Keesing, Professor of Anthropology, Stamford University. This is a parallel study to Professor Elkin's report on anthropological research in Melanesia.
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INTRODUCING POPULATION STATISTICS: A study in the collection and interpretation of population statistics in the Pacific, by Dr. Norma McArthur of the Demography Department, The Australian National University.
Price in Australia ..... *37/6A.*

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